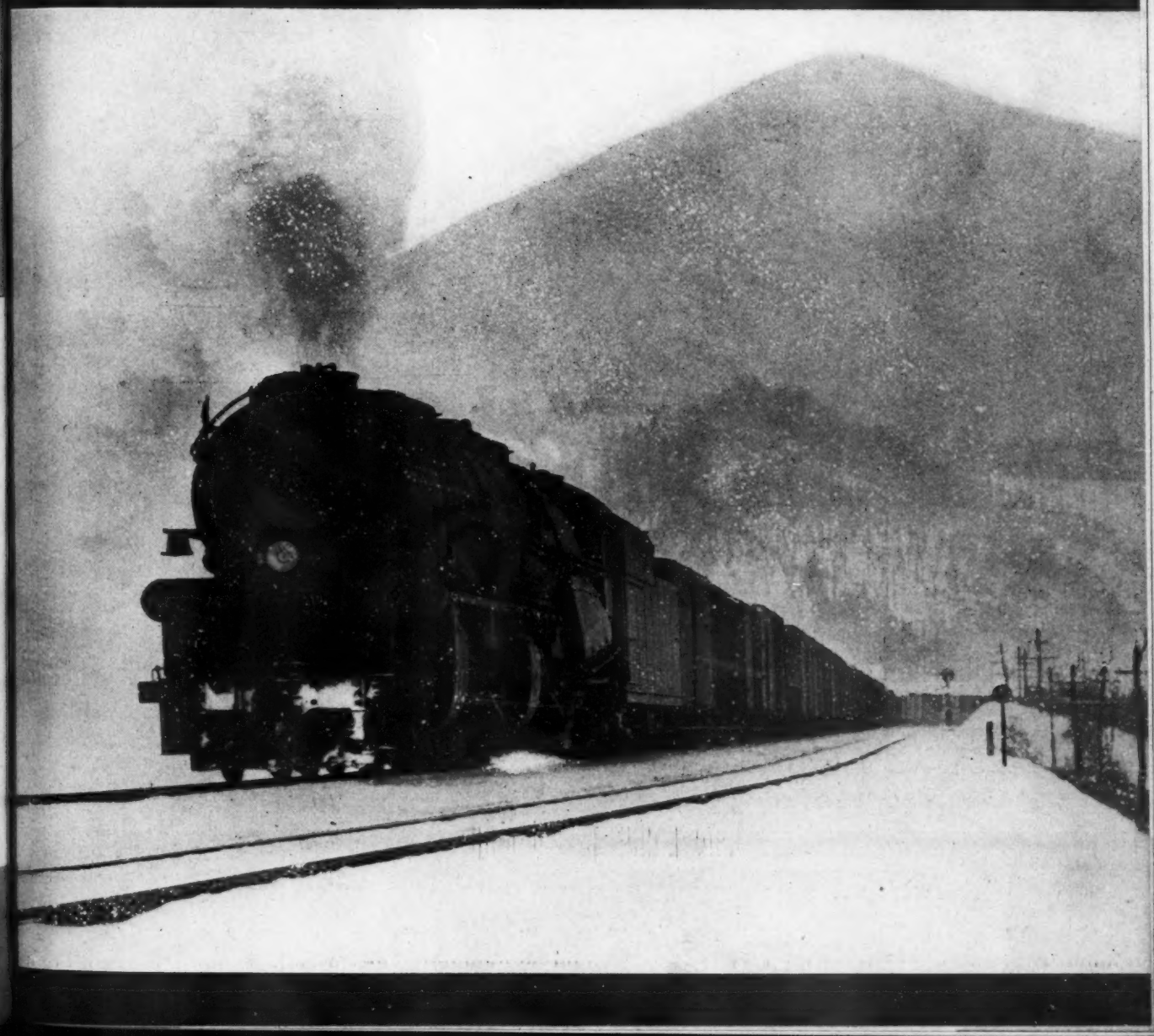
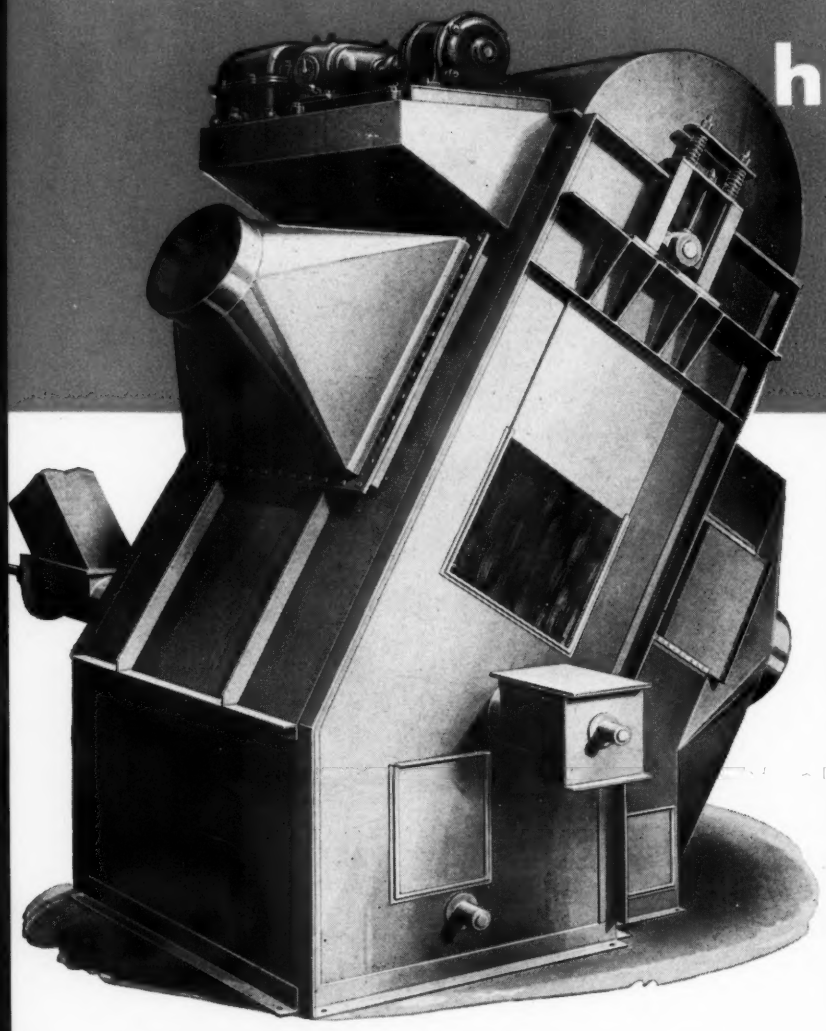
Mining

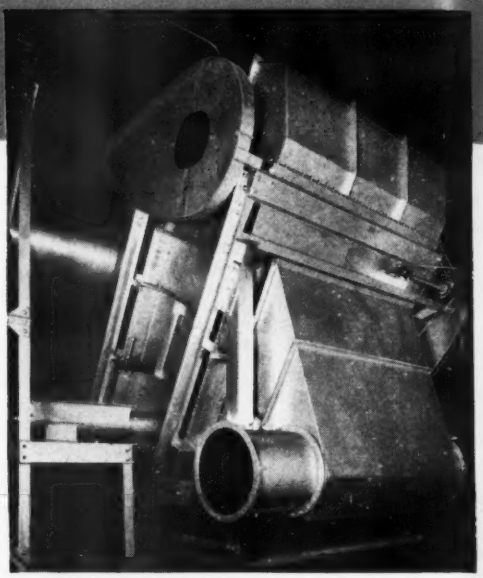
CONGRESS JOURNAL

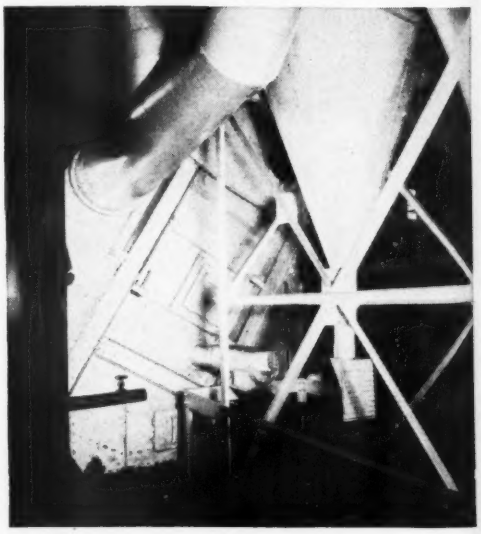
DECEMBER 1947



The answer to the problem of high moisture COAL







LINK-BELT *Multi-Louvre Dryer*

Another step forward in coal preparation technology. The Multi-Louvre is *the* low-cost, high-efficiency unit for drying coal. It is outstanding for many reasons, such as:

—Exceptionally low horsepower requirements.

—First cost lower than conventional types of coal dryers.

—Minimum of degradation.

—Short contact time with the drying air; large pieces do not tend to overheat.

—Simplicity in control of temperatures and volume of drying air.

—Cooling section may be very easily added, for cool discharge into cars or bins.

—Operation and maintenance extremely simple and economical. It is essentially an apron conveyor.

Illustrations at the right show details of a typical installation drying coal for coking purposes. Why not call on one of our engineers to give you the complete story? Send for Book No. 2209.

LINK-BELT COMPANY Chicago 9, Philadelphia 40, Pittsburgh 19, Wilkes-Barre, Huntington, W. Va., Denver 2, Kansas City 6, Mo., Cleveland 13, Indianapolis 6, Detroit 4, St. Louis 1, Seattle 4, Toronto 8.

COAL PREPARATION AND HANDLING EQUIPMENT

Engineered, Built and Backed by LINK-BELT

Mining CONGRESS JOURNAL Contents

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Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress

THE AMERICAN MINING CONGRESS
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ABC

FIND SOME TYPE OF JEFFREY EQUIPMENT

GET THE RIGHT BREAKAGE WITH THE RIGHT EXPLOSIVE ...AMERICAN

Increased tonnage of properly sized material . . . along with maximum control of placement . . . are just two of the benefits you can count on when you use AMERICAN explosives. Available in a complete range of strengths, velocities and densities, AMERICAN explosives are designed to meet efficiently any field problem.

And the intensive research, quality control and modern manufacturing techniques behind all AMERICAN explosives and blasting supplies are your assurance of maximum dependability, safety, speed and all-around economy under any conditions. Whatever your requirement, there is an AMERICAN explosive to meet it.

• *Capable field engineers are available at your call*

• HIGH EXPLOSIVES • PERMISSIBLES

• BLASTING POWDER • BLASTING ACCESSORIES

AMERICAN CYANAMID COMPANY

EXPLOSIVES DEPARTMENT

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BIG YARDAGE + MORE LOADS = REAL PAYDIRT

● That's the sure-fire formula for transforming ore, coal, rock or earth into real pay dirt.

And that's the way Mack super-duty trucks are built to operate. On the toughest off-highway dump work Macks have consistently demonstrated their ability to move bigger yardage per load and more loads per hour.

They've got power in abundance! Extra margins of strength and stamina! Assured traction through Mack's exclusive Power Divider for both four and six-wheel trucks. And throughout their design special stress has been placed on ease of control, maneuverability and clear vision — thus reducing shovel delays to a minimum.

Mack trucks for off-highway service range up to the largest capacities built — gasoline or diesel — four or six wheels. Each is individually engineered for its specific job and each takes to its job only after thorough study of the proposed operation.

Our engineers will gladly advise you on the most efficient use of trucks on your particular job. Write or call your nearest Mack branch or dealer.

Mack

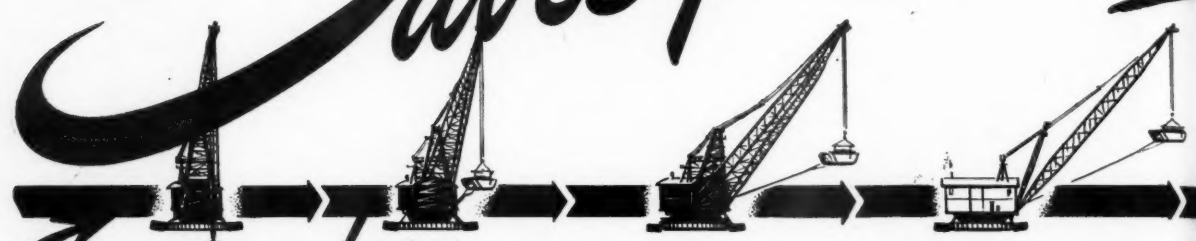
since 1900, America's hardest-working truck

Mack Trucks, Inc., Empire State Building, New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts. In Canada, Mack Trucks of Canada, Ltd.

Trucks for every purpose

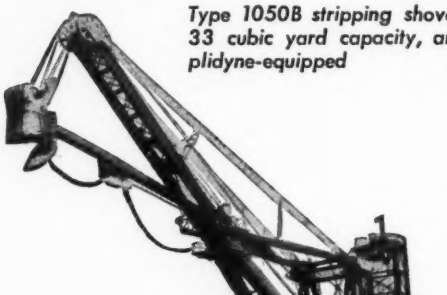
6188

Saves precious

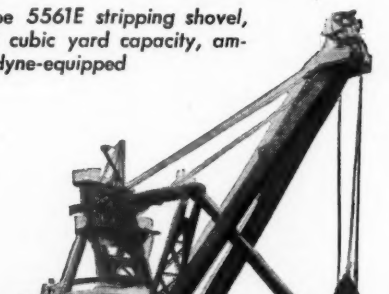


between here...

Type 1050B stripping shovel, 33 cubic yard capacity, amplidyne-equipped

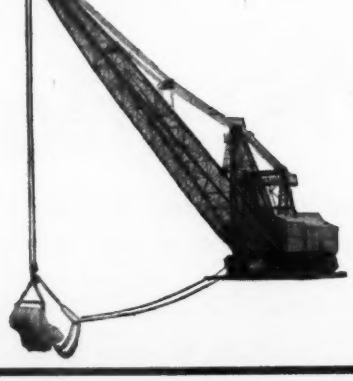


Type 5561E stripping shovel, 35 cubic yard capacity, amplidyne-equipped

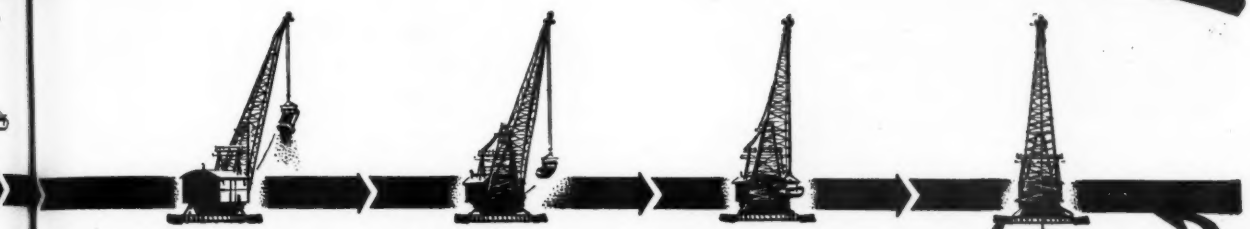


Type 151M loading shovel, 6 cubic yard capacity, amplidyne-equipped

Type 1150B walking dragline for anthracite stripping, 25 cubic yard capacity, amplidyne-equipped



Seconds...



...and here

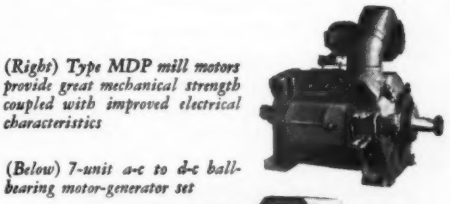
G-E Amplidyne control for electric excavators gives you faster cycles — greater tonnage per machine — lower stripping costs!

It happens whenever an electrified shovel or dragline comes on to a stripping. Yardage records are broken—overall costs go down. A large part of the credit must go to the General Electric Amplidyne—heart of the control system that has helped in no small way to make coal stripping a profitable operation. The reasons?

FIRST—Amplidyne control gives your operator a swifter, surer touch. Motors respond almost instantly to his signals. Fast acceleration and deceleration cuts precious seconds off hoist, swing, and crowd (or drag) motions. Operating cycles are shorter, daily tonnage handled is higher.

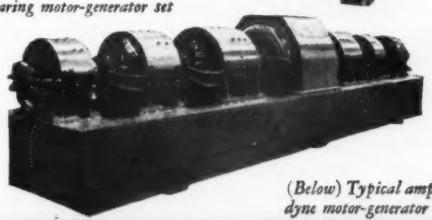
SECOND—Equipment downtime is smaller because stress on pinions and front-end strain is kept to a minimum. The Amplidyne acts as a regulator and even at high speeds, prevents the excessive current and torque peaks which damage electrical and mechanical machinery.

THIRD—Amplidyne is basically simple. Fewer control devices are used in an Amplidyne control system. They need less maintenance—require less space—stay on the job longer. General Electric has equipped more than 2000 shovels and draglines with electric drive. For the past five years, the modern Amplidyne control has been a feature of nearly all large shovels and draglines equipped by General Electric. Without exception, owners of these electrified excavators have benefited from smoother, faster operation and greater shovel capacity per day. When you specify electrical equipment for your next shovel, make sure it is Amplidyne-equipped. Simply get in touch with your nearest General Electric field office for information and assistance. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*

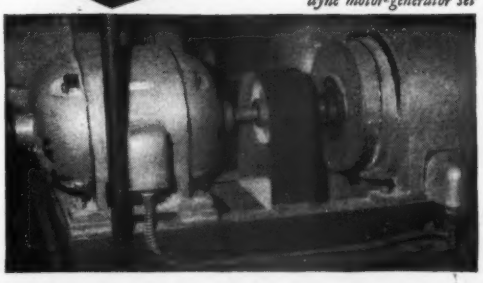


(Right) Type MDP mill motors provide great mechanical strength coupled with improved electrical characteristics

(Below) 7-unit a-c to d-c ball-bearing motor-generator set



(Below) Typical amplidyne motor-generator set



GENERAL ELECTRIC

Drill Faster!
Last Longer!
Cost Less!

Smooth, straight holes drilled with Kennametal bits cost less, save time, and reduce maintenance expense. Compared to other types of bits used for the same purpose, they require less power to drive . . . stay sharp much longer. The tough, hard Kennametal tip stands up longer; has high resistance to abrading, bending, or failing.

It's no wonder Kennametal drill bits have moved up so rapidly among mine operators. For, in addition to fast, low cost drilling in coal, they have the strength and hardness to drill through hard rock and slate.

You can't be handicapped by slate or bony "partings" when you drill with Kennametal. Its sharp, hard edge "bites" in quick, drills right through the rock—ordinarily it's no more difficult than drilling coal.

Kennametal-drilled holes are clean, single-gage—the charge has maximum effectiveness, which results in better breakage and fewer loading difficulties.

Before you buy drill bits, think what these advantages mean to you. For more information write the Mining Division, Kennametal Inc., Latrobe, Pa.

Fast Drilling

The average drilling speed with Kennametal is usually up to 50% faster than with any other type of bit. Abrasion-resistant Kennametal (thought of as the hardest metal in coal mining) remains sharp over long periods of drilling.

Long Service

Data collected in mines all over the country show that it pays to have bits that last the longest. It saves labor cost in terms of handling, changing, and sharpening. Some mines report that these features alone more than pay for the extra cost of Kennametal bits. Kennametal bits commonly last longer than 500 ordinary steel bits.

Low Bit Cost

Many mines report bit cost reductions of as much as 50% before Kennametal bits are dull. Since they can be sharpened many, many times before they are worn out, the bit cost should be reduced even more in many, many instances.

Low Maintenance Cost

Whenever a bit dulls or breaks it loads the drill. Loads cause the drill to overwork. Sooner or later the drill goes off the job, into the maintenance shop. Winding costs are high. Extra drills are needed if too many wear out or burn up at one time. Kennametal drill bits are your protection against these problems. They operate at 25% to 50% less amperage.

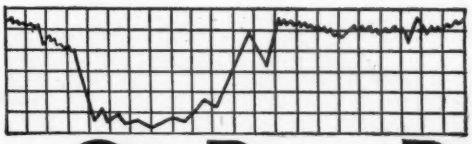
What is Kennametal?

Kennametal is the name of a very hard, durable tool material that was developed by Philip M. McKenna, the president of Kennametal Inc. This new metal is made of powdered particles of various metals, such as tungsten carbide, cobalt, and sometimes tungsten-titanium carbide. In the fine-ground stage it takes 18,000,000,000,000,000 particles to fill an average-size sewing thimble. The powdered particles are formed into Kennametal solids by sintering, the pressed ingredients together in special electric vacuum furnaces. In its solid state it has the best combination of strength, hardness, shock-resistance and rigidity of any metal processed by this method. Kennametal is called cemented carbide in industry, but it is distinctive from other carbides either by the process and/or the ingredient that is used to manufacture it.

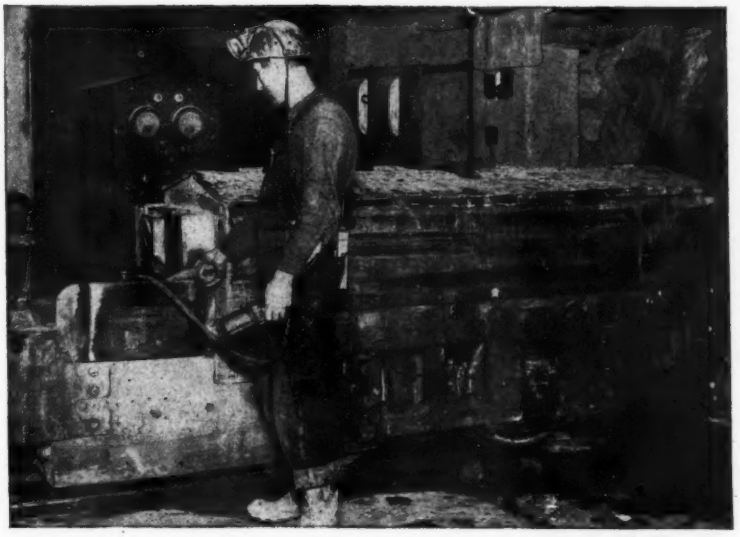
KENNAMETAL

THE WORLD'S LARGEST MANUFACTURER
OF CEMENTED CARBIDE MINING TOOLS

Charge Them From Off-Peak Power



When you use EDISON Nickel-Iron-Alkaline Batteries as the power units of your battery-operated haulage equipment, you will find that an off-peak period of 6 to 7 hours per day is usually enough to get all the charging done with low-cost power. That is normally time enough for full recharge of a nickel-iron-alkaline battery.



The charging can also be done direct from the d-c power lines through suitable resistors, because EDISON Nickel-Iron-Alkaline Batteries do not require critical adjustment of the charge rates.

Withstands Rough Usage—

Yet this is only one of the operating advantages of EDISON Nickel-Iron-Alkaline Batteries. Their steel cell construction successfully withstands rough usage. Their electrolyte is an alkaline solution that is a natural preservative of steel. Their electro-chemical principle of operation is free from self-destructive reactions. As a result, they stay on the job and out of the repair shop; give longer service life than any other type of battery; cut annual operating cost. *Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J. In Canada: International Equipment Company, Limited, Montreal and Toronto.*

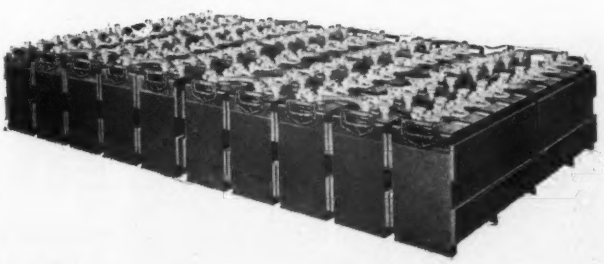
In Mine Locomotive and Shuttle Cars EDISON Nickel-Iron-Alkaline Batteries Give You These Important Advantages

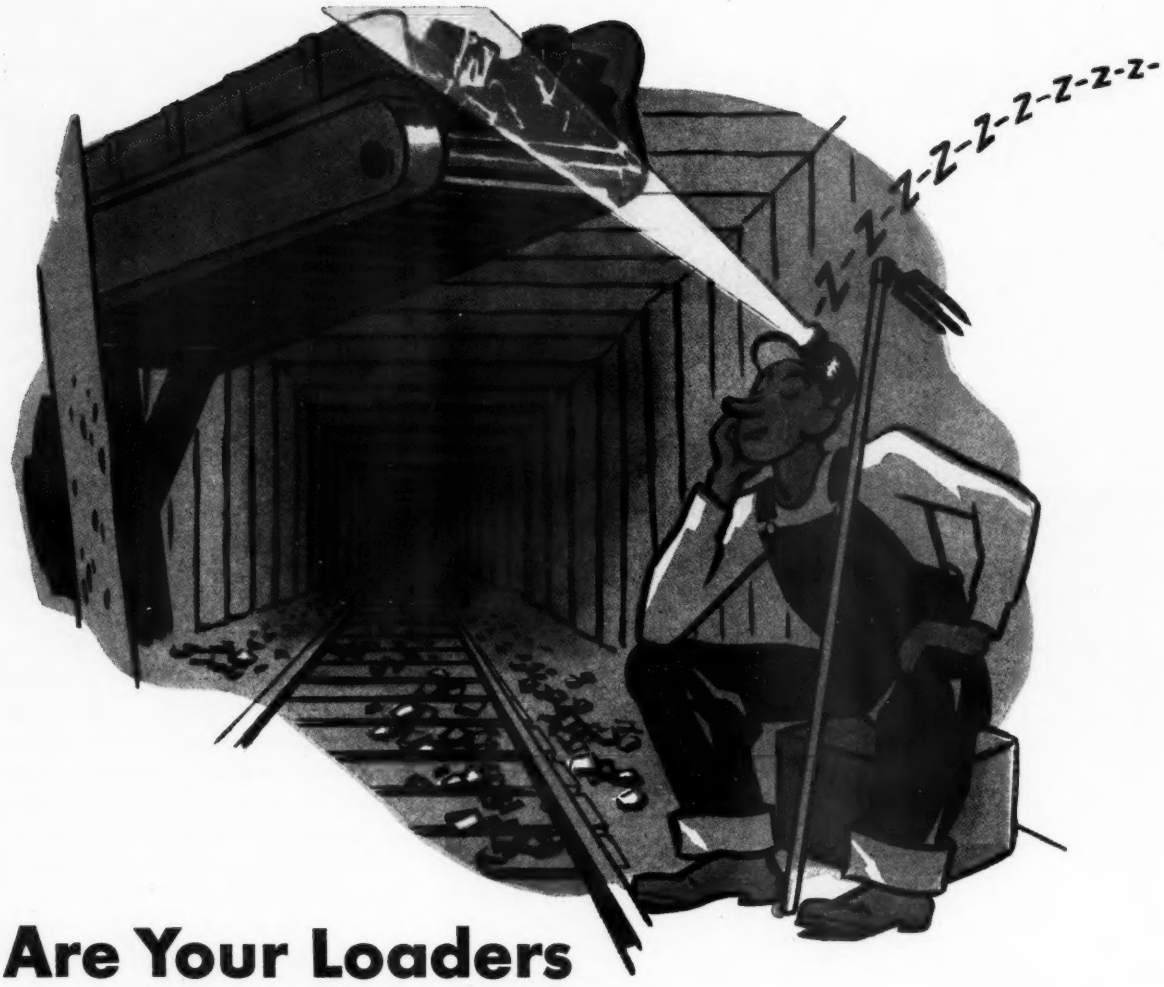
- ★ They are **durable mechanically;** grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel.
- ★ They are **foolproof electrically;** are not injured by short-circuiting, reverse charging or similar accidents; are free from self-deteriorating reactions.
- ★ They can be **charged rapidly;** do not require critical adjustment of charge rates; can be charged directly from mine d-c supply.
- ★ They **withstand temperature extremes;** are free from freezing hazard; are easily ventilated for rapid cooling.
- ★ They can **stand idle indefinitely** without injury, without attention, and without expense.
- ★ They are **simple and easy to maintain.**

EDISON

Nickel • Iron • Alkaline

STORAGE BATTERIES





Are Your Loaders CAR-HUNGRY?

To get the coal out fast and efficiently you need a steady stream of empties returning to the mine... an ample supply of up-to-the-minute mine cars... always there "on time" to keep the loading machines in continual operation.

Modern ACF Drop-Bottom Cars keep the loaders busy. Automatic dumping saves time... permits empty cars to be returned to the loading point quickly. It speeds up loading and reduces your costs per ton!

Ask our Sales Representatives about changing-over your mine to ACF Drop-Bottom Cars for lower costs per ton!

American Car and Foundry Co.

MINE CARS

NEW YORK • CHICAGO • CLEVELAND • WASHINGTON • HUNTINGTON, W. VA.
ST. LOUIS • BERWICK, PA. • PITTSBURGH • PHILADELPHIA • SAN FRANCISCO

IN THIS CORNER... THE COST-CUTTING CHAMP!

Light in weight but a tough, tireless slugger — that's the new Blue Brute WHC (Hand Crank) Drifter, tops in its class for efficiency-plus-economy!

Easier cranking!...Assured by the rigid mounting, natural crank-handle throw and balanced action.

Smoother operation! . . . Sturdy one-piece shell maintains constant alignment of feed screw. Short stroking under heavy loads minimizes stuck steels.

Lower operating costs! . . . Using very little air, the WHC hits hard and fast, while blowing the deepest holes clean. And "Made by Worthington" means longer life, less maintenance.

Add mechanical cranking to these advantages for a quick picture of the other new Blue Brute Drifters — WPMS (Pneu-Motor on Shell) and WPM (Pneu-Motor on Drifter). All three come in 3″, 3½″ and 4″ sizes, *with standardized mountings*.

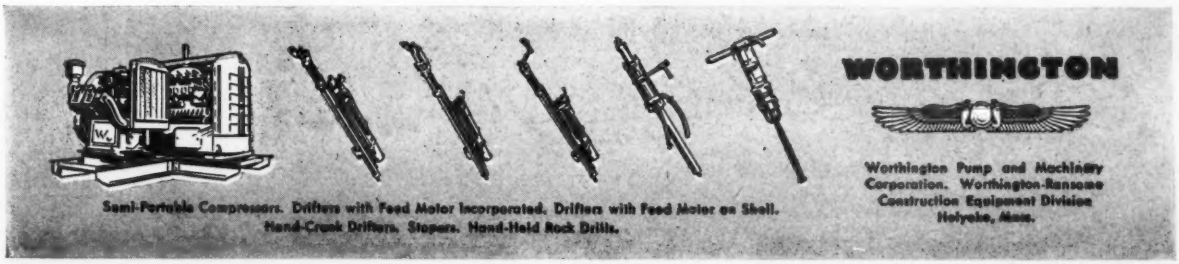
Get more facts on why *there's more worth in a Blue Brute*. Write for literature describing the complete line of Blue Brute Mining Equipment.

HT-13

BLUE BRUTE STOPER

Self-Rotating Model WR-31 is well balanced, easily handled and has many other features that make it a favorite with mining men. Fully described in Bulletin H-1200-B30.

BUY BLUE BRUTES



Semi-Portable Compressors. Drifters with Feed Motor Incorporated. Drifters with Feed Motor on Shell. Hand-Crank Drifters. Stopers. Hand-Held Rock Drills.

WORTHINGTON

Worthington Pump and Machinery Corporation. Worthington-Ransome Construction Equipment Division Holyoke, Mass.

What About the Coal Industry's Public Relations?

Here is what the National Coal Association, through its public relations department, BITUMINOUS COAL INSTITUTE, is doing

ADVERTISING

Three different campaigns are telling the story of coal and the coal industry to editors and publishers; to teachers; and to opinion leaders among the general public. Each of these important groups is regularly receiving its own separate messages in the professional, business, or general publications edited and published especially for that group.

RADIO BROADCASTS

Our new program, "Congress Today," presents unbiased, unslanted "spot news" from the Capitol, with nationally famed Albert L. Warner as reporter and commentator. Each day's broadcast includes a brief news item pertaining to the coal industry. The program is planned to be of particular interest to members of Congress, Government officials, Washington newsmen and others to whom what happens in Congress is of deep interest.

PRESS INFORMATION SERVICES

Publicity releases go to leading newspapers and radio outlets across the country . . . close contacts are maintained with editors and writers to assure that they receive factual information about the coal industry in all its aspects . . . and to make certain that the facts are correctly interpreted.

EDUCATIONAL DEPARTMENT

Under the direction of an eminent educator, school text and reference books are checked and rechecked for the accuracy of their information pertaining to the coal industry. Close personal cooperation is given to schoolbook writers, editors, and publishers to supply them with the most up-to-date coal data. Informative literature is published for and distributed to teachers . . . instructive exhibits dramatize coal's story at gatherings of teachers and other educators.

MOTION PICTURES

Professionally produced film presentations dramatically portray the most modern mining and coal handling methods; the way miners work and live; the importance of coal as a basic commodity and the many ways the industry serves the public. These films are made easily available to all interested clubs and organizations, and have been receiving wide circulation.

SPEAKERS' BUREAU

A well-organized pool of volunteer speakers has been recruited from among coal company executives. These speakers are provided with carefully prepared material on a variety of subjects relating to the industry and are always on call to appear before civic, social and other groups.

The purpose of this extensive public relations program is, of course, to create a more sympathetic public understanding of the coal industry than now exists... to win public appreciation of the skilled management and progressive attitude of the operators . . . to gain recognition for the great public service this huge basic industry is performing under private ownership and management . . . and to assure the industry a useful and prosperous future

With such a penetrating program, it is certain that substantial progress is being made toward realizing these objectives, which are in the individual interest of everybody concerned with producing, shipping or selling bituminous coal.

Now going into its fifth year of increasingly effective operation, the Bituminous Coal Institute—now a department of the National Coal Association—merits the support of everyone in the industry.

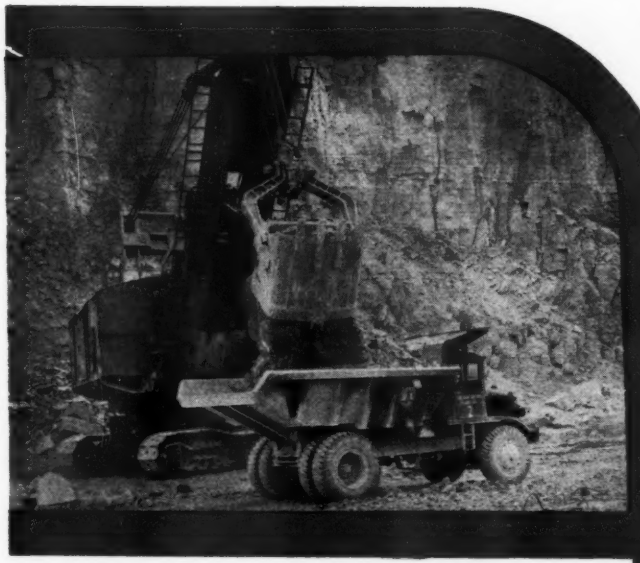
Bituminous Coal Institute

A Department of

NATIONAL COAL ASSOCIATION

Washington, D. C.

BITUMINOUS COAL . . . LIGHTS THE WAY . . . FUELS THE FIRES . . . POWERS THE PROGRESS OF AMERICA



LIMESTONE QUARRY

Reduces Costs with EUCLIDS

● At the modern quarry of The Lincoln Crushed Stone Company at Joliet, Illinois, two Quarry type Rear-Dump Euclids of 15-ton capacity have replaced a fleet of small highway trucks.

Using these Euclids to haul overburden and limestone, the company processes 2,000 tons of stone per 8-hour shift. Loaded by a 4 cu. yd. shovel the Euclids average 8 trips per hour on the round trip haul of 3,000 feet. Dependable continuous performance assures a steady flow of limestone to the primary crusher and screening plant.

Because of their rugged construction Quarry model Euclids withstand the impacts of loading large stone; flared bodies reduce spillage at the shovel and on the haul road. Company records show that the low maintenance and operating costs of these Quarry model Euclids have reduced the cost per ton of material hauled.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO,

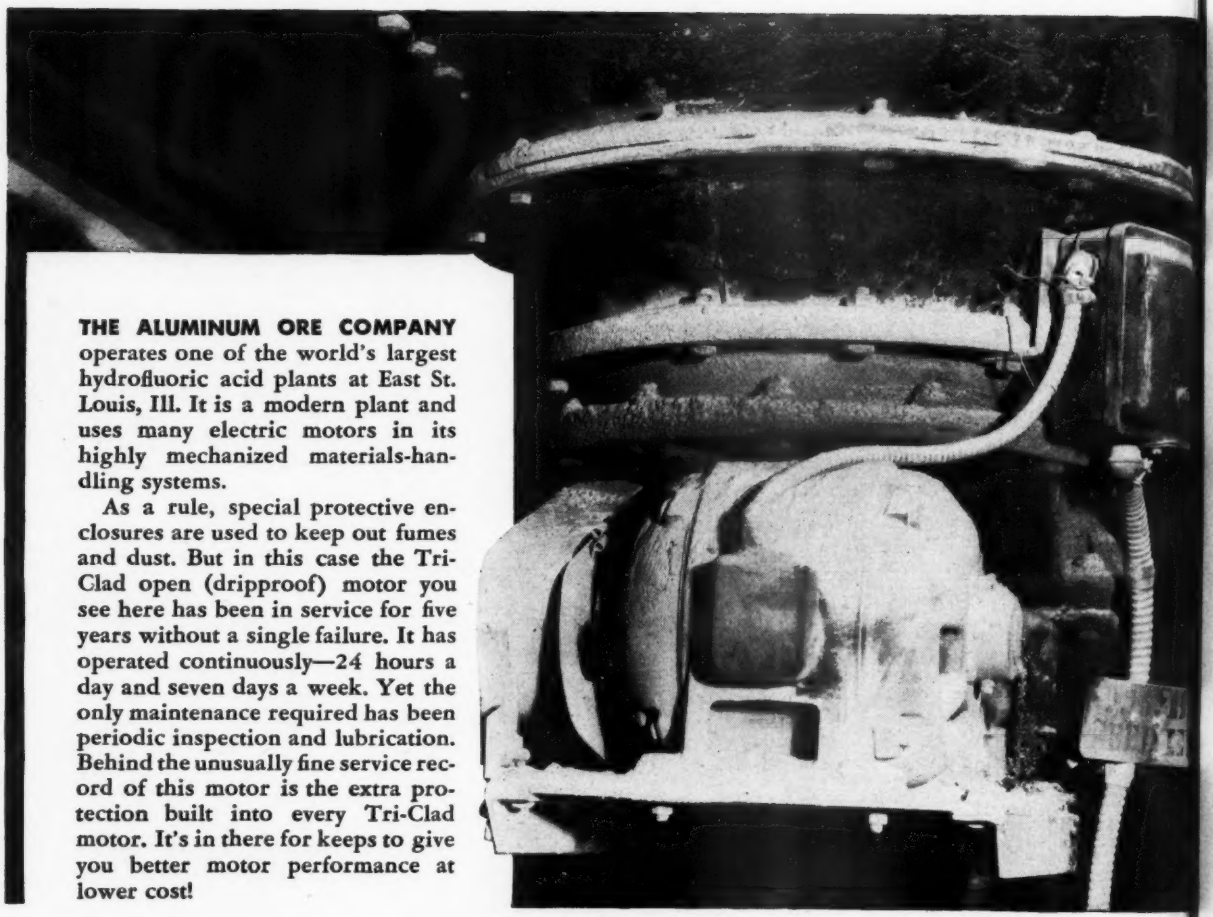
EUCLIDS *Move the Earth*

with **BUGDUSTER** . . . for control of cuttings without dust and without hand shoveling.

with **HYDRAULIC CONTROL** . . . for ease of operation, less time maneuvering machine, tilting without effort on part of operator.

HALSTED STREET AT 48TH • CHICAGO 9, ILLINOIS

4 MILLION HP



THE ALUMINUM ORE COMPANY operates one of the world's largest hydrofluoric acid plants at East St. Louis, Ill. It is a modern plant and uses many electric motors in its highly mechanized materials-handling systems.

As a rule, special protective enclosures are used to keep out fumes and dust. But in this case the Tri-Clad open (dripproof) motor you see here has been in service for five years without a single failure. It has operated continuously—24 hours a day and seven days a week. Yet the only maintenance required has been periodic inspection and lubrication. Behind the unusually fine service record of this motor is the extra protection built into every Tri-Clad motor. It's in there for keeps to give you better motor performance at lower cost!

The toughest TRI/CLAD ever built!

Newest addition to the Tri-Clad motor family is the Tri-Clad totally enclosed, fan-cooled motor. It is designed for use in adverse atmospheres—in iron dust, out-of-doors, in hazardous areas, and chemical atmospheres. Available in both standard and explosion-proof types, this motor gives you these important construction features:

- A cast-iron, double-wall frame which completely encloses and protects the windings and punchings.
- A non-shrinking compound around motor leads which protects motor interior from dust and moisture.
- A rotating labyrinth seal which further protects the motor interior from damage by foreign matter.

CONFIRMS IT!

FOR TOUGH MOTOR JOBS, YOU CAN'T BEAT

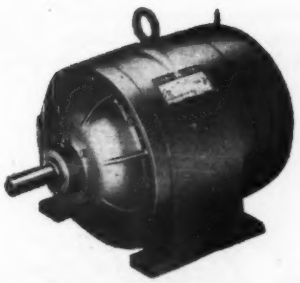
TRI/CLAD

EXTRA PROTECTION

To date, a million and a half Tri-Clad motors, with a total output of over 4-million horsepower, have been purchased by American industry!

In every kind of plant from steel mill to dairy, these motors are proof beyond doubt that you can't beat Tri-Clad extra protection for tough motor applications. Even on jobs where special protective enclosures would ordinarily have been specified, Tri-Clad open motors, applied during the war years, have stood up to heat, dust, and dampness, operating smoothly and efficiently for years with only minimum maintenance.

Today, the Tri-Clad family includes many different types and sizes. But whatever your selection, the Tri-Clad motor nameplate is still your best assurance of a high return on your motor dollar. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*



EXTRA PROTECTION . . . *AGAINST PHYSICAL DAMAGE!*

Rigid cast-iron frame and end shields protect vital motor parts from external abuse. Because they're not at the mercy of a coat of paint, they strongly resist chemical attack and dampness. Cast iron also gives you wide nonyielding metal fits between end shields and frame for ease of assembly.

EXTRA PROTECTION . . . *AGAINST ELECTRICAL BREAKDOWN!*

Motor windings of Formex* wire, together with improved insulating materials, reduce the chances of electrical failure. Heat is dissipated quickly—motor stays young for years and years!

EXTRA PROTECTION...*AGAINST OPERATING WEAR AND TEAR!*

Bearing design affords longer life, greater capacity, improved lubrication features. Bearing seals retain lubricant, keep out dirt. One-piece, cast-aluminum rotor is practically indestructible.

*Trade-mark reg. U.S. Pat. Off.

TRI/CLAD
REG. U.S. PAT. OFF.
MOTORS
- OPEN (DRIPPROOF)
- TOTALLY ENCLOSED
- EXPLOSION-PROOF

GENERAL ELECTRIC

NOW! Vinyl Plastic Coated MINEVENT Tubing

Another American Brattice Cloth Corporation achievement—MineVent Tubing now made from woven jute fibers impregnated and coated with Vinyl Plastic material. Completely flameproof, mildewproof and highly resistant to wear, corrosion, punctures and deterioration.

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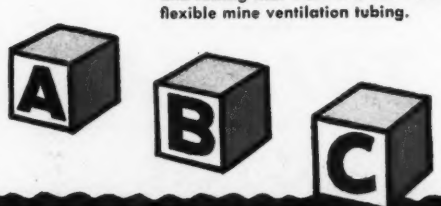
Send for this Bulletin, No. 107. Gives complete data on this Vinyl Plastic Coated material and tells of the months of development and testing that went into this "last word" in flexible mine ventilation tubing.



AMERICAN BRATTICE CLOTH CORP. WARSAW, INDIANA

When the job is tough... get an INTERNATIONAL

On jobs like this, pushing lead ore up and out of a soggy pit, International Diesel Crawlers are the tractors to use.

They have the power to do this work easily. They have the stamina to stay on the job. They require but minimum maintenance, for they have effective, protective seals in rollers and bearings which keep abrasives out — even when knee deep in gritty mud.

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INTERNATIONAL HARVESTER COMPANY
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CRAWLER AND WHEEL TRACTORS · DIESEL ENGINES · POWER UNITS

Built to take a battering

Mind if we say it once again? *Today's heavier loads require heavier, sturdier ties!*

Bethlehem's No. 5 Tie is built for the battering, bruising service that is now commonplace in mine haulage. Even though you may have purchased thousands of these ties, we suggest you look closely at the picture shown here. It will help to point out once again why the No. 5 is a "bargain buy" under modern, heavy-duty conditions.

Note, first, that thick, rugged section. Note, too, the channel design, which gives added, truss-like support where it is needed most.

The clips are both sturdy and convenient. To install a No. 5, all you do is place the rail base snugly against the stationary clip and tap the revolving clips into place. Do the same with the other rail. There's your tie, completely installed! No spiking, no gaging. No rotting out, for the whole tie is of steel.

Bethlehem's No. 5 is designed specifically for 40-lb rail. It will handle the full weight of your loaded cars and your heaviest mechanized equipment. Though a bit higher in first cost than the lighter ties, its extra life more than offsets this initial difference. Our representative would like to show you why.

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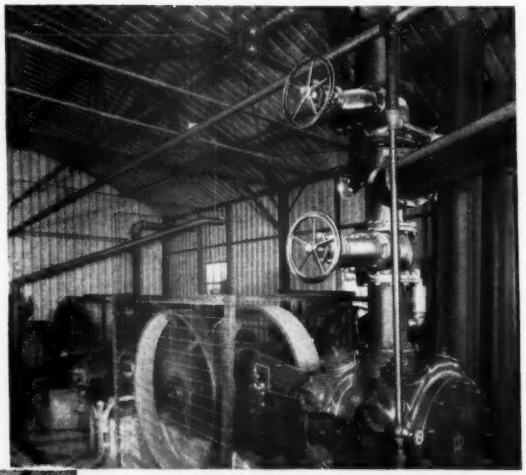
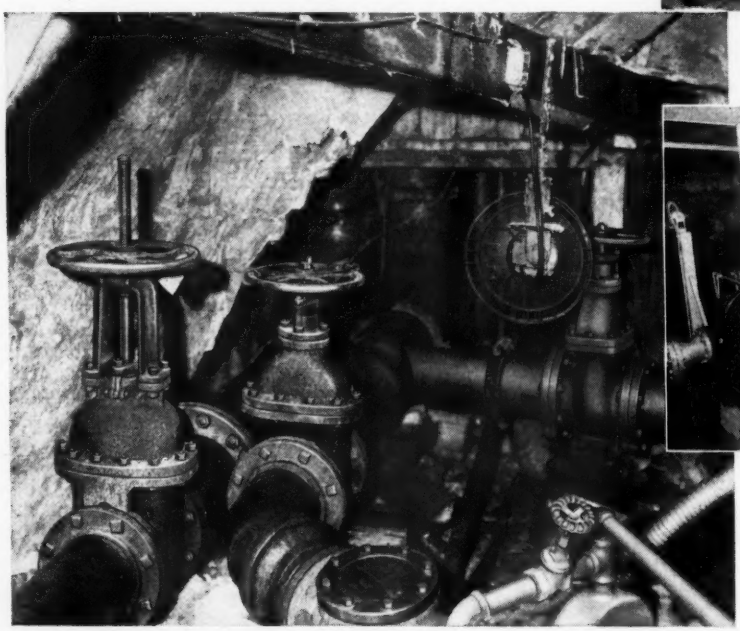
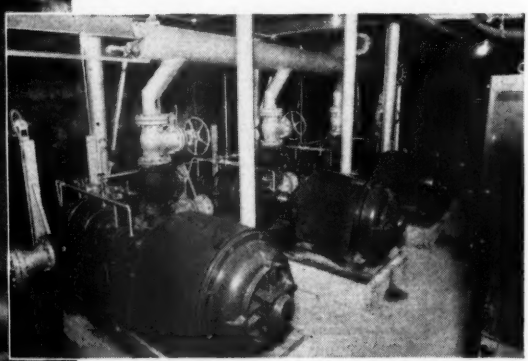


FOR AIR COMPRESSOR SYSTEMS, *Crane supplies everything in piping... from the largest valve to the smallest fitting.*





PUMP ROOM *in a lead and fluor spar mine. Piping maintenance is simplified by getting everything from Crane... valves, fittings, and pipe.*

DRAINAGE LINES *in a metal mine at 1900-ft. level. For dependable control... for proper selection for every need... this mine standardizes on Crane valves and fittings.*

EVERYTHING FROM...

VALVES
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CRANE

PLUMBING
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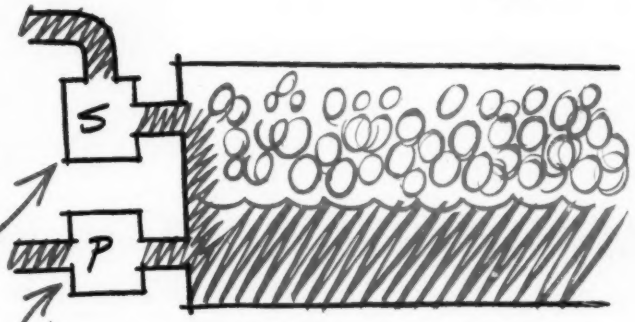
HEATING

FOR EVERY PIPING SYSTEM

LUBE MEMO

Air bubbles can wreck bearings

In our dry-sump system, air sucked through scavenging pump makes lube foam.



When foam gets into pressure pump, it loses suction, pumps insufficient oil to bearings...!!

Rep. says RPM DELO Diesel Engine Lubricating Oil stops foaming—How?

1. Special compounds in RPM DELO Oil minimize bubbles.
2. Lab. tests prove bubbles that form break up immediately

Phone RPM Delo Oil Rep.

DIESEL ENGINE RPM DELO LUBRICATING OIL

STANDARD OF CALIFORNIA • San Francisco, Calif.
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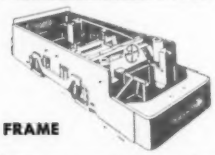
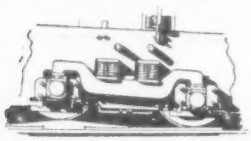
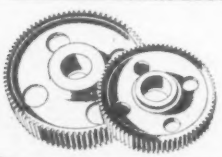
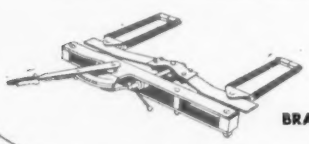
THE CALIFORNIA OIL COMPANY • New York
STANDARD OF TEXAS • El Paso, Texas

built to cut

Locomotive Component	How It's Built	Its Advantages
 FRAME	End frame is cut from rolled steel plate and welded to heavy steel side frames.	Frame stays aligned and rigid. No periodic tightening is necessary.
 SPRINGS	Strong coil springs rest on drop center equalizer bars which distribute the weight to the tops of journal boxes.	Wheel loading is equalized. Locomotive rides easily with less wear and tear on trackage.
JOURNALS	Sealed journals, fitted with tapered roller bearings, are greased through pressure gun fittings.	Lubrication is simple. Bearing seals retain lubricant and keep out dirt.
 MOTORS	Motor windings use rectangular conductors to save space. Coils are coated with Glyptal lacquer.	Power losses and heating are decreased. Windings are not affected by moisture, oil, and weak acids.
 GEARS	Gears and pinions are one-piece steel forgings treated to give hard-wearing surfaces and a tough core.	Less gear wear minimizes maintenance and extends service life.
 BRAKE	Brake rigging consists of lever type hand brake with equalizing lever to brake shoes.	Powerful braking action can be applied and released quickly. Time is saved in maneuvering.
 CONTROLS	Controller is progressive series-parallel type.	Conserves battery power by providing economical, low-speed running connections.

hauling costs !

STORAGE-BATTERY MINE LOCOMOTIVE

In mines where ore transportation requirements can be met with a relatively small number of hauling units, General Electric storage-battery locomotives quickly pay for themselves in low-cost haulage. They need no large capital outlay for power-carrying equipment.

Beyond this, there's the extra strength and staying power built into General Electric mine locomotives. They're built to absorb the hard shocks and abuse of rough mine service. Consequently, they spend fewer hours in the repair shop and more time on the tracks hauling capacity loads.

What Are Your Locomotive Requirements? Forty-five years of locomotive-building experience have taught General Electric how to build locomotives with all the advantages listed on the opposite page. And General Electric makes *all* types—cable reel, trolley, and storage-battery. Before you decide on your next hauling units, consult a General Electric locomotive specialist. Tell him what you are looking for. More than likely, he'll be able to recommend a General Electric mine locomotive that meets your requirements exactly. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC

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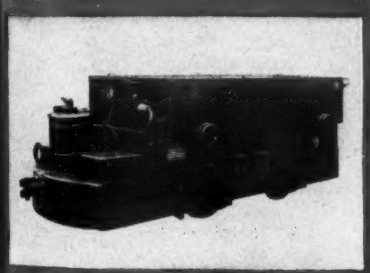
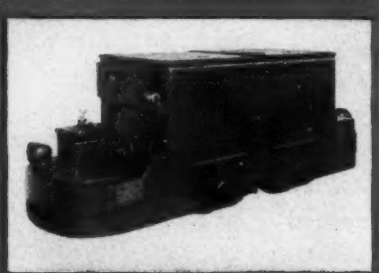
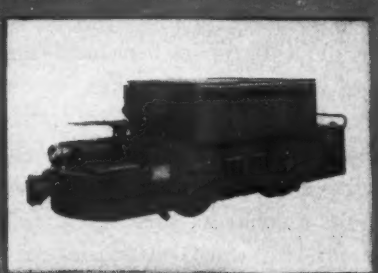


General Electric 4-ton storage-battery locomotive, 20-inch gage



General Electric 4-ton storage-battery locomotive, 20-inch gage



General Electric 5-ton storage-battery locomotive, 24-inch gage

POWER... plus SAFETY

Exide-Ironclad Batteries and fast, flexible shuttlecars...

They provide the right combination needed to meet the newer safety requirements demanded in coal mines. And *more* than safety, with Exide-Ironclad powered shuttlecars coal moves faster from loaders to the main line, gathering costs are reduced, and tonnage figures climb.

Exide-Ironclad Batteries for shuttlecars, locomotives and trammers are used by more mine operators than all other batteries combined. They have the *high power ability* that frequent stop-and-go service requires; a *high maintained voltage* throughout discharge; the *high capacity* needed to assure full shift availability; plus dependability, long life and ease of maintenance.

If you have a special battery problem, or wish more detailed information, write for booklet Form 1982.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 · Exide Batteries of Canada, Limited, Toronto

Editorials

JULIAN W. FEISS, *Editor*

December, 1947

The Mainspring

THE accompanying quotation is a thundering indictment pronounced by one of the greatest men of our time. On October 28, in a speech in the House of Commons, Winston Churchill defended the concept of individual freedom before a Parliament dedicated to a Socialist doctrine administered by an inept Labor government.

Winston Churchill stands today as one of the few world statesmen who comprehends the basic struggle between individual freedom and collectivism—that the two cannot be reconciled either in the field of economics or in the mind of man.

Strange to say, this conflict was well understood over a hundred years ago. Alexis de Tocqueville, undoubtedly the best known French writer on our early American political system, stated that democracy extends the sphere of individual freedom but socialism restricts it—that while democracy attaches all possible value to each man, socialism makes the individual an agent, a mere number. Democracy seeks equality in liberty and freedom; socialism seeks equality in restraint and servitude.

> "I do not believe in the capacity of the state to plan and enforce an active high-grade economic productivity upon its members or some of them. No matter how numerous are the committees they set up, or the ever-growing hordes of officials they employ, or the severity of the punishments they inflict, or threaten, they cannot approach the high level of internal economic production which, under free enterprise, personal initiative, competitive selection, the profit motive to rectify failure, and the infinite processes of good housekeeping and personal ingenuity, constitute the life of a free society.
>
> "It is the vital creative impulse that I deeply fear the doctrines and policy of the Socialist government have destroyed or are rapidly destroying in our national life. Nothing that they can plan and order and rush around enforcing will take its place. They have broken the mainspring and until we get a new one the watch will not go."

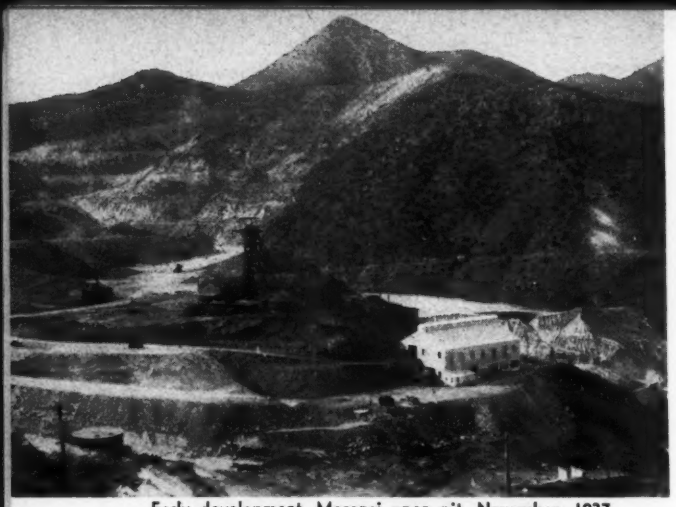
Today in the United States we are between the horns of a terrible dilemma. With our economy strained in the wake of the most catastrophic wars of history, with our citizenry struggling against the mounting spiral of inflation, and with the world about us grasping at the straw of collectivism, we stand alone—the only major power wherein individual enterprise has not been either severely restricted or throttled completely.

Already there are storm signals on our own horizon. President Truman has gone before the people requesting the power to reimpose certain controls on our economy. Since it is human for many of us to turn to government in times of stress (we have done it before) and since it is stated that these controls are only a temporary expedient, some of this power may be granted to the President with the hope of attaining a degree of national economic stability in the near future.

This form of synthetic security, which our many economic planners have advocated of recent years, is but a delusion. The power conferred by the control of production and prices is unlimited and whether or not it is exercised by a gigantic cartel, a monopolistic corporation, or a government, the results are the same—the individual loses his freedom of choice. To confirm this statement we have but to recall the sinister doctrines of Axis economy or examine the current scene in Russia.

Freedom of choice—not economic security—is the basic need of man. Without it men are serfs, slaves or even prisoners; although it may be granted that each of these conditions may present a semblance of economic security for the individual. From this freedom of choice stems the vital creative impulse of which Winston Churchill speaks—the greatness of a nation, the energy of its people, its industrial, political, and economic strength.

Never has economic security been more desirable to man than freedom. Never in the past has government control successfully replaced the individual initiative of the governed. Finally, it will never be possible for any government to determine the destiny of its citizens in a manner more satisfactory than through the free choice of the people themselves.



Early development, Morenci open pit, November, 1937

Engineering and Development Problems at Morenci

By WALTER C. LAWSON
Phelps Dodge Corporation

The Development of an Open Pit, on the Scale of Morenci, Is a Task Requiring Both Engineering Skill and Comprehensive Operating Knowledge. How This Was Done, and the Procedure Used in the Selection of Equipment, Constitutes an Important Chapter in the History of Modern Mine Operation.

★

FOLLOWING 4½ years of preparatory work, the Morenci open pit became a substantial producer of copper in January, 1942 and before production was started from the original plant rated at 25,000 to 30,000 tons per day, plans were underway to increase the capacity by 80 per cent. The making available of large amounts of copper from the Morenci operations less than 60 days after the Japs struck at Pearl Harbor, together with very substantial increases within the next two year period, proved to be one of the fortunate circumstances in the World War II effort of American industry.

The first phase of the development work consisted of engineering followed by selecting equipment, constructing roadways and trucks, electrifying tracks, erecting shop buildings, and removing of advanced stripping. All of these things were again required

Panorama of Morenci open pit—July, 1938

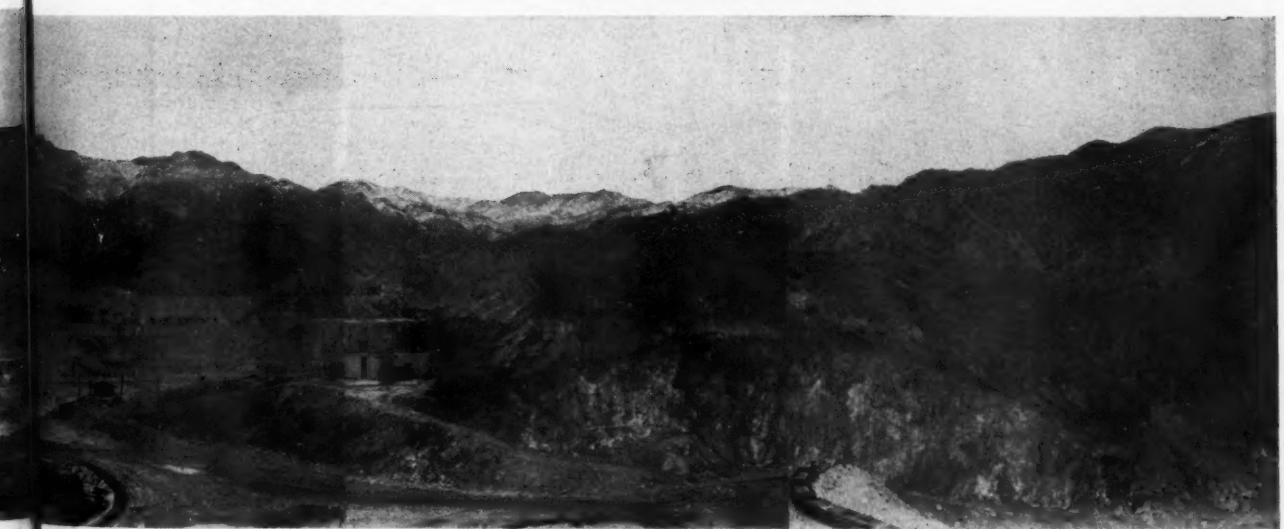
preparatory to the extension to increase capacity.

Aside from the actual physical problems that existed in the pit development, the period was marked by changed times and conditions. This was the time of selective service, the War Manpower Commission, releases, certificates of availability, E. R. C., recruiting and finally in the case of Morenci, the use of imported Jamaicans. It is believed that the shortage and quality of labor created the greatest of all problems.

Engineering and Planning

The Morenci copper mines are among the oldest and largest in the State of Arizona and to date the combined production of all companies in the district has been about two and three-quarter billion pounds of copper. Whereas the existence of the ore body now being mined as the Morenci open pit had been known for a long time, the desirability of its being mined by an open pit was developed more recently. The advantages of open pit mining are obvious. First, the low maintenance cost of an open pit in periods of inactivity is an item of important advantage. During periods of curtailment of production there is little to deteriorate or to be kept in repair. Also of advantage are favor-

Above—February, 1940. Below—January, 1945



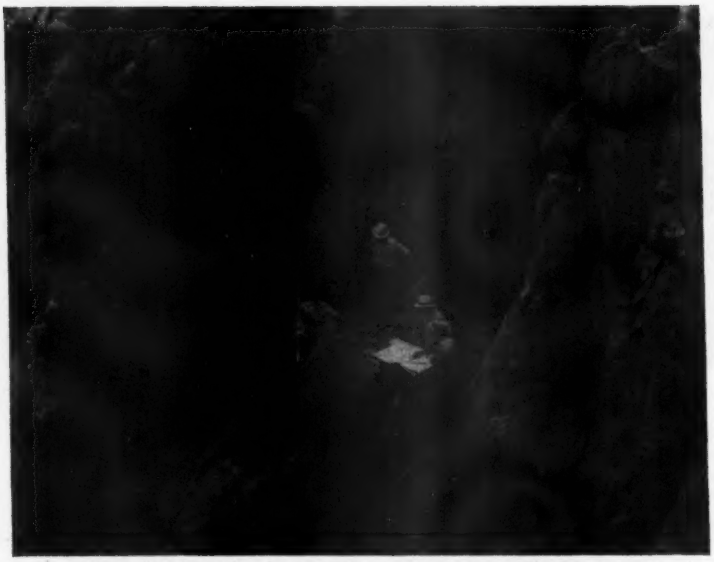
able production costs and good flexibility. During times of variable metal demand, the latter feature of a mine is desirable because production can be more easily adjusted to existing requirements. Too, because the material within the ultimate boundaries of a pit is handled a little at a time, all the ore can be cleanly separated from the waste, while either dilution of the ore with waste or the recovery of only part of the ore is inherent in most underground methods.

The Ratio of Waste to Ore

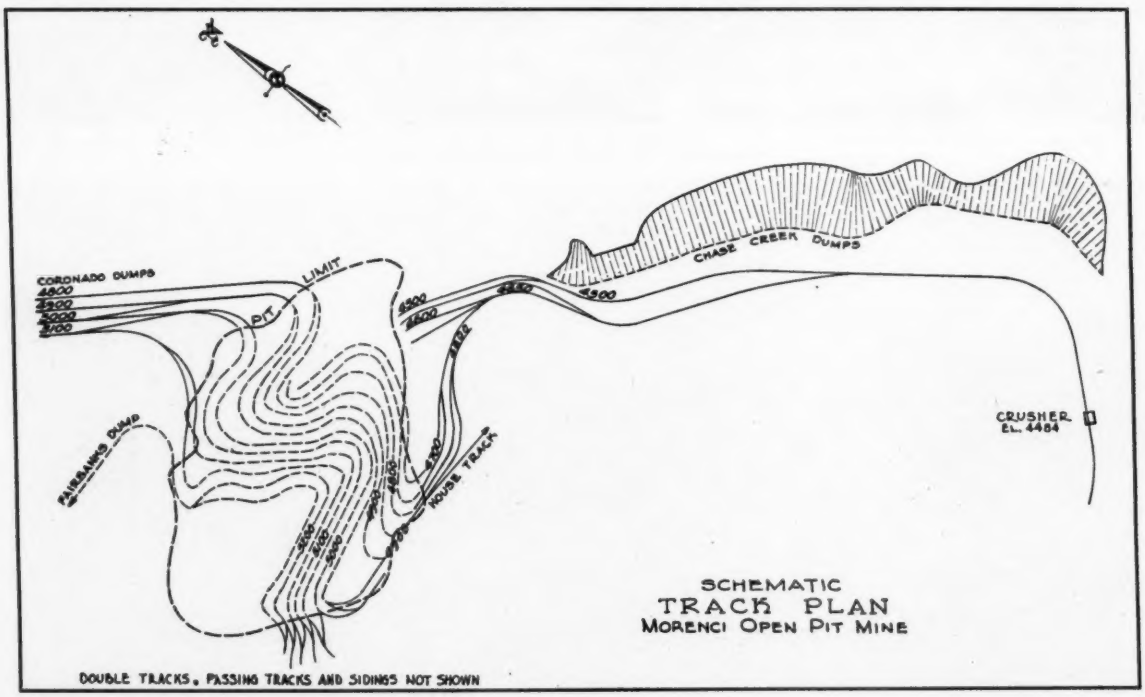
One of the foremost considerations in an open pit layout is the quantity of barren waste that must be handled to extract the ore. Consideration must be given not only to the total quantity of waste but also to the amount that must be removed initially to expose ore. Further, it is important to know whether the production of ore after it has been exposed can be maintained at a satisfactory rate with a relatively uniform rate of waste removal. In most pits it is probable that for reasons of equipment balance and because of physical limitations, a ratio of two waste to one ore is about the maximum to project for any period of its operation.

Another important consideration in an open pit layout is the rate at which it can produce ore after the initial stripping has been done. Factors such as bench height, blasting methods, track laying methods, shovel capacities and physical characteristics, including track or roadway layouts, will determine the amount of ore per day that a pit can produce on a uniform and sustained basis. At Morenci it has been possible to maintain a production of 50,000 tons of ore per day or at a rate in excess of three tons of ore per foot of ore bench exposed which by comparison with many other pits is an exceptionally high rate of mining. Operating methods and types of equipment which avoid delays to operations must also be used to maintain the mining rate mentioned.

There are certain essential accessory features of a workable pit. By the very nature of the mining procedure nothing is permanent within a pit area because all the working faces are gradually being pushed back. However, to assure constant production it must be possible to locate the haulage tracks from the pit edge to the crushers and to the dumps in permanent, or at least nearly permanent, position. It was possible at Morenci to install main ore tracks and main waste tracks all outside the final limits of the mining because of the limits of the ore body and the nature of adjacent terrain.



Surveying for railroad construction required many difficult setups



Rugged Terrain Influenced Track Layout

The construction of the track roadbed from the crusher to the pit was one of the most interesting and difficult engineering phases of the pit development. Switchbacks at the pit edge are in a rugged canyon and are built mostly on fill dumped there by initial truck operations according to predetermined plans. From the bottom of the switchbacks to the crusher the alignment followed along a series of 200-ft. quartzite bluffs. This position for the main haulage track was necessary due to the topography near the pit area and because of the elevation of the crusher. The track system as laid out will permit the movement of 85 per cent of the material over favorable grades.

The topography along the roadbed of the main tracks was so rough and precipitous that the usual surveying procedure for location was quite impossible. The study and layout, therefore, as well as the control of construction, were all made and maintained through the use of a very comprehensive system of triangulation stations placed along the edges of the bluffs and at any points which existed near to the roadbed grade. By using heavy curvature it was possible to carve a narrow track roadbed along the side of the bluffs. This has since been lined out into good operating position by dumping mine waste into the intervening canyons from rail cars.

The Morenci development in addition to application of new mining methods embraced the construction of an entirely new reduction plant consisting of a concentrator, smelter, power house and shops. In order to provide adequate information for the design of the new concentrator it was necessary to develop a flow-sheet and test various types of equipment in a pilot plant, using ore that would be typical of the ore body being uncovered. A portion of one of the old concentrators that existed in the district was reconditioned for this purpose and one of the problems in the development of the open pit was furnishing ore at a maximum rate of three thousand tons per day for testing purposes. This required the stripping of a portion of the mine where the capping was relatively shallow so that the exposed ore could be mined and transported to the pilot plant. During the years 1939 to 1941, inclusive, a total of two million tons of ore was mined for testing purposes.

During the time that ore was being produced from the test pit, active stripping operations were concurrently underway developing ore for the new concentrator. It was determined that in order to have sufficient ore exposed it would be necessary to remove 50,000,000 tons of advanced stripping. After 50-foot benches were established with the use of dump trucks, mining was accomplished principally by rail haulage and the use of the trucks diminished. Access by rail to the benches was made by a series of switchbacks laid on 4 per cent grades.

Selection of Equipment

The selection of the several kinds of equipment needed for the pit operations offered many problems as to types, sizes, capacities, cost, etcetera. That the selections were satisfactory is evidenced by the fact that the same selections, save for new and improved types, would be made again if the job were being done over.

Test Pit and Construction Equipment

Diesel-powered 1½-yd. shovels and 5-yd. (10-ton capacity) dump trucks were selected for this work. The size of the shovel bucket was controlled by the crusher size at the test plant and the truck size by the dumping pocket. These sizes for shovels and trucks, in addition to meeting the requirements of the test plant, were also the right sizes for construction and have been in continuous use in one way or another since the beginning of operations. This equipment is now

Sealing quartzite cliff, mine-mill railroad construction

Diesel electric locomotive rounding curve at the site of churn drill blast

)-yd. ore cars being loaded by a 5-yd. shovel. Bench tracks are all vel. Electric locomotives are operated by 500 ampere-hour storage batteries

Electrified ore switchbacks are shown above at lower left. Much of the waste goes to the right with diesel-electric haulage

being used for the production of silica for smelter flux and limerock for lime burning operations. The type of truck selected has a speed of 30 miles per hour on level roads and 10 miles per hour on adverse grades of 9 per cent. Diesel power was specified for the shovels for much of the work because of the inaccessibility of electric power.

Drilling Equipment

The pneumatic drilling equipment selected consisted of lightweight jackhammers using 1-in. round steel and sinker-type drills operated from tripods using 1¼-in. round steel. Detachable drill bits have been used exclusively in order to eliminate the problem of transportation that exists when using conventional steel. Wagon-type drills have been used for drilling horizontal and toe holes.

Nine inch diameter electric-driven churn drills have been used for primary drilling on the pit benches. Their operation has been considered entirely satisfactory; however, since they were purchased a heavier type drill using larger diameter bits has been developed. It seems probable that in some types of ground the larger drill might prove to be more economical as it is thought that the larger diameter hole drilled would permit a wider drill hole spacing.

The Choice of End-Dump Trucks

As previously mentioned, the disposal from the initial bench development was made with dump trucks. These are end-dump, 22½-yd. size. Of the original 18 units purchased, 13 are still in use at the property on the uppermost benches where bench length and limited tonnage do not warrant the construction of railroad tracks. While the trucks were being used to make fills for track roadbed it was necessary to operate them loaded on 8 to 9 per cent downhill grades. This imposed a serious braking duty and disclosed that the early make of trucks of this size was lacking in braking power. As originally purchased the trucks were equipped with gasoline engines but later, as replacements were needed, a change was made to diesel-type engines which resulted in less maintenance and in lower operating costs.

In the present state of development of transportation equipment, the most economical way to haul when moving big tonnages over the long distances that exist in large pit operations is with locomotives and railroad cars. This has been well established in the Morenci operations where it has been determined that the cost of operating a locomotive with an eight to nine car train, including all equipment repairs and maintenance of railroad tracks, is only 50 per cent greater per shift than the cost of operating a big dump truck. The advantage in cost is apparent when it is pointed out that the tonnage moved per locomotive shift is 2,000 as compared with 1,000 for trucks and that the average length of haul in the case of railroad transportation is 2¾ miles as compared with ½ mile for trucks.

Five-Yard Shovels Selected

For the mining of ore and waste from the Morenci open pit, 17 5-yd. electric shovels, all of the same make and model, are in use. There are several factors that must be taken into consideration when selecting the size of shovels for an operation, the notable ones being: (1) bench height, (2) blasting methods, (3) fragmentation of material, (4) track work, (5) the distribution of values in the material being mined for treatment, and (6) type of haulage equipment.

The four factors first mentioned above cannot be considered singly but must be taken collectively. Generally speaking, a high bench face will result in lower drilling and blasting costs and better fragmentation. On the other hand, high benches make for more difficult shoveling conditions when facing up banks because of the danger of overhangs. Economic reasons dictate, however, that the banks must be thoroughly faced up before making the succeeding blast. When using tracks for loading it is also important that the shovel have full cuts in order to avoid the additional expense of making a track throw for a partial cut. At Morenci, 50-ft. benches and 5-yd. shovels were selected as this provided a good balance. Blasting results have been satisfactory, the shovels are not unduly delayed by overhangs, and practically all bank shots provide just two full shovel cuts which are taken with a single track building operation. This latter feature has been an important factor in the maintenance of a high production rate with a limited length of ore bench exposed.

In cases where the values contained in the material being mined for treatment vary appreciably from place to place within the mining area, the operation of a greater number of "smaller" units rather than a lesser number of "large" units is desirable from the standpoint of leveling out the grade of the material being handled by the treatment plant. In the Morenci pit the copper content varies a good deal between benches and from spot to spot along a single bench. The use of 5-yd. shovels has given a more uniform head grade at the mill than would have been possible with larger buckets. However, the shovel size must be kept in balance with the size of the haulage equipment. If the latter is undersize for the shovel, the shovel operator loses time in spotting his bucket before unloading it and, in these cases, a large amount of overcast results which must be rehandled. Shovels with 5-yd. dippers are in good balance with big trucks and dump cars of 30-yd. capacity or over.

Rail Haulage

Both Diesel and Electric Locomotives Used

There were many interesting problems relative to the selection of locomotives for the Morenci job. In the first place, there were two distinct haulage situations. In the case of the upper waste benches, haulage tracks were made level or on slightly favorable grades to dumps located in an opposite direction from the ore movement. For ore and waste on the ore benches the track system required a series of switchbacks with 4 per cent ruling grades and the haul was longer as well. Based upon these existing

conditions it was decided to start with diesel-electric locomotives in the waste stripping and later, after the main ore tracks were in permanent position, to electrify them and then assign the diesels exclusively to the upper waste benches. The 1,000-H. P., 125-ton units were finally put into this service. The diesel-electric locomotives provided the means of starting rail haulage much sooner than would have been possible with electric locomotives because the temporary positions of many of the tracks at the beginning made it impractical to electrify them. By using diesels on the waste benches it has, of course, also eliminated the need for electrifying many miles of tracks.

The electric locomotives selected for the ore haul are 1,400-H. P., 125-ton units equipped with storage batteries for use on the benches and on the dumps when waste is hauled. These units are arranged so that when the pantograph is in contact with the trolley, the batteries are automatically charged and, under normal conditions, the locomotives are under the trolley wire enough of the time to keep the batteries charged for the loading operations at the shovels and while running on the dumps. Several alternative methods were considered for haulage on benches and of these the use of portable trolley was most attractive. However, when the flexibility of locomotives equipped with storage batteries was compared with the problems incident to moving portable trolley, the desirability of using batteries was evident. It was especially desirable to eliminate the need for trolley on the mining benches because of the high rate of mining that would be required per foot of bench exposed.

Dump Cars

Rail haulage operations were first started with the use of 30-yd. (62-ton capacity) side dump cars as this had been the standard size for pit operations throughout the country for many years. However, before it was necessary to purchase more than a small portion of the full complement of cars required, a study was made of the possibility of increasing the size from 30 to 40-yd. capacity. It was found that a 40-yd. car could be manufactured with the same dead weight to live weight ratio and, as it was believed that the use of the larger equipment would result in a lower maintenance cost because of the fewer number of units in service, the larger size was selected for the bulk of the requirements. This large capacity car carries 85 tons. All dump cars at Morenci are equipped with roller bearings.

A general view of the reduction works where the ore from the pit is treated

Self-side dumping cars were selected for both the ore and the waste hauls. This permitted interchangeability in dispatching between ore and waste shovels, elimination of a car dumper at the Coarse Crusher, and the elimination of a storage yard at the crusher as well as extra locomotives required for spotting cars at a dumper. A longer haul between the pit and the crushing plant might, of course, have resulted in a different selection of cars used for ore.

The 4 per cent grades favorable with loads impose a severe braking duty on down-bound trains and have required more than the usual braking equipment on the dump cars. The ordinary equipment is supplemented with load brakes which are cut in when the cars are under load and result in doubling the pressure of brake shoe against the car wheel when a brake application is made. Straight air operation is also a feature on the dump cars and, in addition, the electric locomotives are equipped with dynamic brakes which provide from 30 to 40 per cent of the braking effort needed when a loaded train is descending the steepest grades.

Miscellaneous Equipment

The largest size diesel-powered bulldozers equipped with towing winches have been in use since the beginning of the operations. In a recently published article in which was given the relative value of equipment used in ending the war with Japan, Admral Halsey listed bulldozers fourth, only behind the submarines, radar and planes. In open pit work it is probable they would lead the list.

Morenci open pit, mine-mill railroad and the Chase Creek dumps

Safety is stressed in the operation of mechanical mining

The Accomplishments of Mechanization

The Improvements in Mining Equipment and Operating Practices Over the Past Years Have Furnished a Solid Foundation on Which the Future Coal Industry Will Be Built

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By G. B. SOUTHWARD

Mechanization Engineer
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AT this time in each year it is customary to look back over the preceding 12 months to sum up what has happened, and while this article has some such object in view, it will depart from the conventional in several respects. Instead of looking back over one year's time, it will look back some 20 years; and instead of presenting a review of events it will present a record of accomplishment. It is rather trite to say that the future is measured by the past and furthermore, this saying hardly applies to the coal industry. What has taken place in the development of mechanization is not a measurement—it is the foundation on which future mining will be built. To those who have been closely engaged in this work, the year to year progress may seem slow, but a perspective over the past two decades will show a progress that is indeed remarkable. Certain it is that if Rip Van Winkle had been a coal miner and had started his 20 years' sleep in 1927, he would not be able even to find his way around in a modern coal mine —much less to know what is going on.

High Production Level Must Be Maintained

Today the coal industry is definitely facing a new era. For the first time in history its importance in our economical, industrial and domestic life has become recognized by the public. Its decline has ceased and more coal must be supplied, not only for use as a direct source of heat and power, but to furnish a base from which oil and gas may be manufactured to supplement the production from the wells. Just how we are going to mine the future requirements is a problem which we now must consider. The record tonnages of World War II were made possible by mechanization working under pressure—the same high tonnage rate must still be maintained and because wartime pressure is not possible in peacetime, the future technique of coal mining must be brought to a higher productive level.

Critics (unkind) have made the point that the industry has not kept up with

the modern pace because coal is mined in the same way that it was a century ago. Fundamentally that is true; we still dig it out of the solid seam and transport it to the surface. However, in spite of the critics, there is nothing to indicate that we will not continue to do this for at least during our own generation. Other methods proposed for getting the energy in a coal seam to the surface have not proven successful. Underground gasification is theoretically possible, but the experiments have a long way to go to reach a practicable level. Introducing a solvent into the seam and pumping liquid coal to the surface is a dream which has not even reached the laboratory stage and commercial atomic energy is still so far away that we do not have to worry about it as a competitor. So we come back to the fact that coal must be dug out of the ground and hauled to the surface, and our concern today is to bring to a higher state of perfection, the developments in machines and mining practices that have been made by mechanization so far. In order to see what is still to be done a comparison of what has been accomplished over hand mining practices may be in order.

Changing to Machine Methods

When mechanization was first adopted in coal mining, it soon became apparent that a machine could not be substituted directly for a hand miner and that radical changes in the practices and procedure underground would have to be made. The coal had to be shot down differently; the timbering had to be set to permit passage of the machines; the haulage system had to be improved to reduce the time lost by the loader at the working face and to handle a large tonnage out of a smallworking territory. The necessity for such changes was, in the beginning, considered to be a serious obstacle to the development of mechanical loading because it was evident that it would cost more money to provide better than hand-loading facilities.

However, as time went on and these improvements were installed, it became evident that instead of being a debit they were actually a credit in the mine cost; in other words, they increased the operating efficiency and the production by reducing delays which under hand loading had always been considered as a necessary part of coal mining. To be more specific, systematic timbering reduced the amount of time lost in cleaning up slate falls; good track provided for quick car changes at the loading machine and eliminated interruptions from wrecks; and an efficient haulage system provided for rapid movement of trips. Then, new equipment came into use—shuttles and belt conveyors. Consequently, a greater proportion of the shift became productive time which was followed by improvements in machine designs and increased tonnages mined by an operating unit.

The basic advantage which mechanical loading has over hand loading is the speed of advancement of the working places, both in entries and rooms. In hand mining it had long been the established custom for a miner to regard his working place as his own private property where no trespassing was permitted; consequently, a place advanced according to his individual ability. A production of from 10 to 15 tons per shift was a good sustained performance for hand loading so entries and rooms made slow progress. Then, absenteeism further reduced the rate of advancement and also required that additional working places be provided — increasing the mining area under development. Taking all of these things into account, a room entry had quite a long life from the time it was started off of the panel entry until the final pillar was completed—this life of course varied in different mines, but even in the most efficient, it was measured by a matter of years.

With mechanized loading the entire procedure is changed; the "individualistic" miner is replaced by a group unit who perform all of the work in a panel. This necessarily results in a systematic and regular operation of all rooms in a panel and requires that everything must be kept up to schedule—no part of the operation nor no places can be allowed to drag behind. The immediate effect is an increase in the speed of driving entries and rooms. A clean-up is made in a matter of hours, instead of days, and not only that, but repeating cycles are the custom whereby more than a single cut is loaded out from a working face during a single shift. The next step is the adoption of multiple shifting; this in fact is now regarded as an economic necessity in order to produce a greater tonnage from the equipment in a unit and reduce the investment cost.

The change from hand to machine mining naturally called for increased use of electricity. Mine power requires a technique of its own; specifications for surface use do not apply and coal mine mechanization was actually made possible by new developments in transmission, conversion and distribution equipment for underground service.

Advantages of Increased Speed of Mining

With multiple cuts and multiple shifts, one working place under machine loading will produce a far greater tonnage than was formerly mined with hand loading where one clean-up per day was a peak and not an average performance. More clean-ups per place means fewer places under development and the consequent reduc-

Good track and efficient haulage are needed for high tonnage operation

tion of working territory needed to produce a given tonnage is accompanied by a corresponding reduction in the total amount of track, wiring, drainage and dead work.

There are other advantages from the increased rate of mining. A room, 300 ft. long which formerly required several months, or perhaps as much as a year, for driving and mining its pillar, is now completed in a matter of days—less than a month. This usually reduces the timbering problem, as a room is finished before the top has much time to deteriorate. Then again, because the mining is concentrated into a smaller area, the roof action is favorable for pillar recovery—not only is there a small retreating area to maintain but the rapid and regular advance of the gob line promotes systematic roof breaks.

A still further item of advantage which the rapid rate of mining provides is in permitting rooms to be worked to the dip. This results from two causes. First, mechanical gathering haulage, whether by mine cars, shuttles or room conveyors, can operate efficiently on an up-grade. Then, the question of water does not present the difficulty that it does in hand mining. The fewer number of working places in mechanization require fewer pumps to keep these places dry, and furthermore, the large tonnage from a smaller area permits the cost of installing adequate drains and water-handling equipment. As a result, it is now quite customary to drive rooms both to the right and left in a panel, thus increasing the tonnage contiguous to the haulage in the room entry, whether by track or belts.

Retreat Mining and Pillar Recovery

Since the early days of mine mechanization, some method of long face mining where a machine could load continuously through the shift, and make a high per cent of extraction, has been a goal which has been striven for but not yet reached. Some day it will undoubtedly be an accomplished fact but so far the stumbling block has been the roof action. A true long wall involves so much labor cost for building packs to protect the haulage roads, that this method has not been economically possible, except in a relatively few mines in this country, and in the main, the majority of our mechanized loading operations use what is basically the room and pillar system.

However this has actually worked out very well, because mechanized loading has made possible the adoption of true retreating systems. This has always been recognized as the most efficient mining plan, but with hand loading it was seldom attained. The reason was economic—too much time was required for the entry development and in addition, as an entry drove away from the live workings, its small tonnage and long haul made high cost coal.

In conveyor mining, all face work is done on a continuous cycle

A compromise was frequently adopted under hand loading whereby the rooms in a panel were worked advancing as the entry developed; then after the panel was mined to its outbye barrier, the room pillars were recovered retreating. This method had its obvious disadvantages. It meant that the pillars, particularly in the first rooms driven would stand for long periods—several years—before the coal was finally recovered. During this time, timbers would decay and roof falls occur. Furthermore, if the track were left in until the pillars were mined, there was quite a large investment tied up in track material which was lying idle; if the rails were taken up when the room was completed, they had to be relaid later when the pillar was mined. Under these handicaps, it naturally resulted that in many cases, pillar recovery was not even attempted.

All of these discouragements to retreat mining with hand loading disappeared with mechanical operation. Entry development became very rapid and coal operators were not slow to take the advantage of this opportunity to go to retreating systems. However, because it is now possible economically to work rooms in two directions, many companies combine the two systems—driving the rooms advancing off one side of the panel as the entries are developing and after the panel barrier is reached, then mining retreating on the opposite side.

The practicability of pillar extraction with mobile loading machines and its economy, when considering questions of labor costs, coal quality and value of surface lands, will have to remain in the controversial class for the time being, until some definite facts and figures can be used to show what conditions actually exist. It is true that the earlier operations of mechanical loading did not make much effort to recover pillars; so many other problems came first. However, within recent years, this situation has

In mechanical mining, mounted drills replace the hand augur

changed and there are companies today who claim a higher percentage of pillar extraction with mobile machines than was previously made with hand loading. Certainly it would seem that this should be the case, and where pillar mining is practical and does not involve excessive timbering or other extra labor it would appear that the higher recovery of coal should automatically reduce the costs of dead work in the panel—more tonnage to absorb the money spent for such items as entry yardage, track laying and wiring.

Conveyor mining was first developed and used in low coal with hand shoveling on to face conveyors and while this method is still widely used, there is a marked trend toward substituting some type of loading machine for the hand shoveler. But whatever the method of loading, it is the practice to take the pillars. The labor of laying a conveyor up in a room is a natural inducement to the operator to get as much coal as possible from each installation and the room pillars provided the answer. The percentage of recovery therefore in conveyor mining has always been high, and nearly always the pillar is drawn immediately after the room has driven up. Methods of recovery vary, but ordinarily a 100 per cent extraction of the pillar is not attempted, as experience has shown that it is more economical to leave small pillars of solid coal as roof support protection to the men and equipment and as a curtain against the gob. Such pillars are usually less than 5 per cent of the total coal in the area.

Whether by conveyor mining or mechanical loading, both systems have one particular factor in common which is that the entry development is confined to the area immediately contiguous to the productive workings. Since a set of entries can now be advanced faster than the room and pillar mining can retreat, it is no longer necessary to spread the mining over a wide territory; two panels under production and one panel under development is quite a customary proportion.

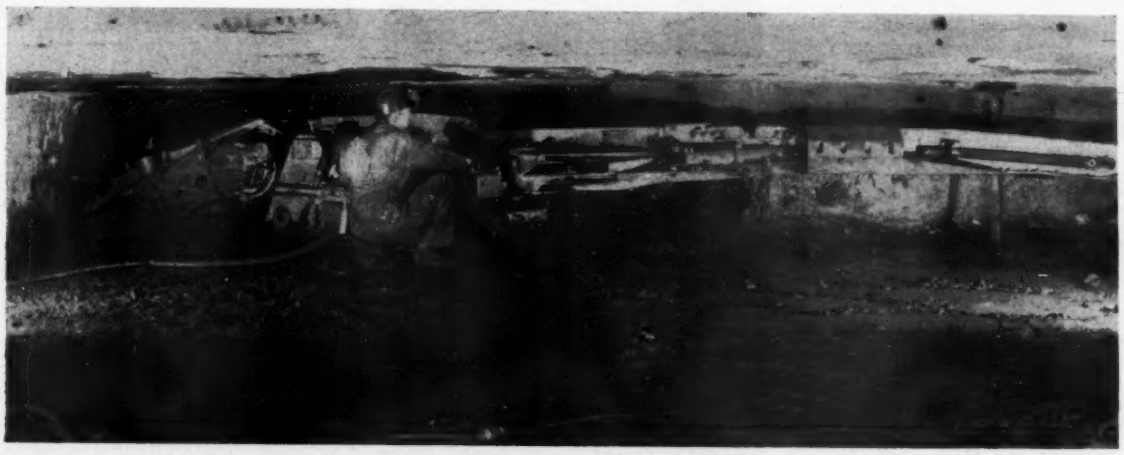
Mechanical rock dusting increases mine safety

Conclusion

In looking to the future, regardless of what new equipment may be invented or new practices evolved, we may set down one fundamental that has been learned and will always apply—the real determining factor of the tonnage produced by any system of mechanical mining is *management*. A mechanized operation is a coordination of a number of operations where the tonnage is determined not by the performance of any one of these phases, but by the performance of the unit as a whole. To effect this coordination is a function of management and the amount of coal produced is a gauge of the efficiency of the supervisory force.

Coupled with management — or rather a part of it — is the maintenance of equipment. Here again the job is to keep all machines running, and one of the greatest differences between mechanical and hand loading is that in the mechanical mine we must think and plan entirely in terms of the performance of an operating unit as a whole. In so doing, we must consider all the operations in an entire room panel, and we must further take into account the complete mining of a panel—the entry development, the room advancement and the final recovery.

In a final summing up of the accomplishments of mechanization we must not fail to give due credit for the part which increased safety has played. The elimination of hand loading removed some hazards, but the adoption of machine mining introduced new ones. These new dangers have become recognized and the coal industry is making a real scientific approach to the problem of accident reduction underground. We can look forward to the mine of the future whose safety record will compare favorably with those of modern surface industries.



Mobile loaders have entered the low coal field

The Taft-Hartley Act and The Mining Industry — *(Part I)*

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In response to widespread demand for a review of the effect of the Taft-Hartley Act upon the mining industry, this article explains its applications and the benefits provided for employes, employers, unions, and the public. The authors also suggest further changes designed to strengthen the law and eliminate many of the present unsound practices so detrimental to good labor-management relations.

Charles R. Kuzell

Frank J. Ryley

THIS article comprises a report on the labor legislation program of the Western Division of the American Mining Congress, as carried on in the post-war period, and views pertaining to the need for further development of such legislation. Our effort in presenting this material will be, following a review of what measures have been advocated in the past by the Mining Congress and which of them have been written into the Taft-Hartley Act, to indicate a number of additional measures as further amendments which we believe embody the consensus of opinion among mining men whom we have consulted.

Pre-War Labor Law Required Correction

Pre-war labor legislation such as the National Industrial Recovery Act, the Anti-Injunction Act and, particularly, the National Labor Relations Act of 1935, popularly called the Wagner Act, did not promote harmonious labor-management relationship in United States industry. So many unfair burdens were placed upon management and so much monopolistic control developed in labor leaders that it was obvious that much correction was needed. The period of World War II saw the by-passing by government of collective bargaining and the imposition by government agencies of further burdens upon employers. Immediately following the cessation of hostilities the Western Division of the American Mining Congress publicly declared its policy demanding corrective legislation. Subsequent conventions reiterated and developed such declaration of policy until it culminated in the one emanating from the September, 1946, Denver Convention of over 2,000 mining men. That statement was subsequently approved by the Board of Directors of the American Mining Congress. Its contents may be fairly summarized as follows:

"We believe in true collective bargaining. We believe also that as a result of the present day labor laws and policies of the Government, collective bargaining is frequently bypassed by irresponsible labor leadership in favor of strikes, even against the Government. The time has come when it is necessary in the interest of the country and even of the unions that Congress promptly enact legislation to restore true collective bargaining.

"Such legislation should affirm as lawful the strike by lawful means for legitimate ends. Such a strike is sometimes necessary as an economic weapon. However, the strike against

Arizona copper mining came of age at Bisbee

other employers not involved in the dispute, and the strike by a combination of unions to tie up an entire industry are weapons which are too dangerous for the continuation of free enterprise and the safety of the Nation.

"To remedy the present situation the following action should be taken:

1. Prescribe procedures for true collective bargaining.
2. Prohibit industry-wide bargaining and industry-wide strikes.
3. Make unions subject to the anti-trust laws.
4. Make unions suable as legal entities in the courts.
5. Outlaw mass picketing, violence, and intimidation.
6. Recognize and prevent unfair labor practices by unions.
7. Provide equal employer and employe freedom of speech on matters of unionization, bargaining negotiations, strikes, and anything else.
8. Provide that NLRB findings of facts be based on a preponderance of relevant evidence.
9. Protect the rights of employes as individuals to work regardless of membership in a union.
10. Prohibit employer-union negotiated welfare funds or any other payment by employers of money to unions, except through authorized pay-roll deductions.
11. Declare that foremen, as well as other supervisory professional and administrative employes, are not covered by the National Labor Relations Act.
12. Exclude as improper subjects of collective bargaining proposals encroaching on the employer's right to manage the business."

Work of AMC Before Congress

The work of the Mining Congress did not end with the passing of that resolution. We wish to take this opportunity to point out to the membership the thorough manner in which their resolution was advocated and the recommendations vigorously prosecuted by the officers of the Congress and particularly the Washington office staff under the guidance of Mr. Julian Conover, its very able and alert secretary. A parallel resolution that the United States Congress should correct the United States Supreme Court's interpretation of work time under the Fair Labor Standards Act was presented before the Judiciary Committee of the Senate by Mr. Conover himself in a very strong statement. This presentation was a contribution very helpful to the enactment of the Portal-to-Portal Act which removed a shocking abuse by labor leadership of the original intent of Congress when it originally passed the Fair Labor Standards Act. Mr. Howard I. Young, President of the Mining Congress, appeared before the House Committee on Education and Labor, not only to recite experiences of the company of which he is president under the operation of the labor laws but also to vigorously present the recommendations of the Mining Congress by means of a written statement and considerable oral testimony. The authors of this paper at the request of our Washington office made a similar presentation before the Senate Committee on Labor and Public Welfare. Throughout the whole period that labor legislation was pending in the United States Congress, Mr. Conover and his staff kept abreast of the situation and advised the membership in up-to-date weekly bulletins which urged and did secure individual action of members at the time of legislative crises. We feel certain that no other organization can boast of having its recommendations more vigorously and efficiently followed up.

It is not only very important to the mining industry but also to this country that the American Mining Congress maintain an active labor legislation program. Our objective is a fair and equitable code of law to promote and control relationship between management and employes for the mutual benefit of themselves and the public. We believe in true collective bargaining as we have repeatedly declared, but we maintain that labor relations law should make it impossible for an organization with un-American objectives to seize and subvert bargaining power to the attainment of un-American objectives. It has been frequently pointed out and testimony has been given to the fact that seizure of control of the working force in the mining industry is one of the strategic steps planned by subversive organizations to overthrow the political and economic systems of the whole nation. The mining industry has been and probably will continue to be exposed to attempts to implement that strategy.

Non-Competitive Attitude of Unions

While we were earnestly striving to cooperate with the Congressional committees during the development of the recent legislation it was quite obvious

that unions were demonstrating an absolutely uncooperative attitude by refusing to make any constructive suggestions whatsoever. Nevertheless, the Taft-Hartley Act has not taken any of the rights away from individuals, from employes, from the working force as a whole. It has not destroyed any legitimate union activity. It has, however, taken away—we hope—some of the processes which permitted monopolistic control of the working force of this country. Some union leaders whose opportunities for unlimited power have been reduced are therefore seeking to mislead the public with untrue statements and by slogans such as "the slave labor bill." William Ingles, a well qualified and experienced labor relations consultant of Washington, D. C., has described this campaign as follows:

> "Union propaganda intended to break down the Taft-Hartley Act and to free unions from its restrictions is going to dwarf any campaign ever organized to effect legislation. According to current reports, it will include newspapers, magazines, movies, radio, dramatics, speeches, debates, 'education,' every medium for influencing public opinion, the full works.
>
> "It is becoming apparent that the unions seized upon the Taft-Hartley Act as an object of bitter opposition as much for their own organizational purposes as anything else. They were coming to need a common enemy, a focal point for a common effort, and the Taft-Hartley Act seemed to offer it. Hence, the build-up it has had as the dread threat to the welfare of labor. It has to be built up into a blood-chilling menace in order to enlist the support of the members in the supposed cause of self-defense, to make common cause against the common menace. The unions may find, in time, that they are stuck with their fictitious issue but, for better or for worse, during the coming years there is going to be a roaring fight to discredit and to destroy the Act, with every device that money can buy used to mislead the public."

The extent to which the working force in industry has been already misled is made very obvious from an article in *Look*, September 30, 1947, entitled "The Strange Case of the Taft-Hartley Law" by Claude Robinson, President of Opinion Research Corporation. This organization made an extensive survey of opinion among working people of all categories—48 per cent union members, 52 per cent non-union members; 27 per cent women, 73 per cent men; 19 per cent Dewey voters, 51 per cent Roosevelt voters. The results of the poll are shown in the following tabulations:

We have been given permission to use the data, which is more detailed than that contained in the *Look* magazine article. The results of the survey show that about 79 per cent of all those interviewed—and who had an opinion to offer—were definitely in favor, plank by plank, of each of the ten principal planks in the Taft-Hartley Act and would favor a single law so providing each of those items. On the other hand, the same people, when merely asked if the Taft-Hartley Act should have passed, responded only 31 per cent in the positive, 54 per cent in the negative and 15 per cent with no opinion. It also turned out that only a minority of the people interviewed could cite any provision of the Taft-Hartley Act, and practically none could state any manner in which the act would affect him individually. The worker favors what is in the law, but does not know the law contains what he wants! Unions did a good job of educating the working force with respect to the provisions of the Wagner Act. They are not going to do a similar job with respect to the provisions of the Taft-Hartley Act, and perhaps this education will have to be the duty of management. Management had its right of talking to the working force completely cut off by the Wagner Act, and now that this right has been restored under the Taft-Hartley Act apparently management has not yet recovered from the paralysis of its voice. Let us not forget that it is the duty of the members of the Mining Congress to actually make use of what the lawmakers have provided for the benefit of our industry and every man in it.

FAVORABLE RESPONSES ON PRINCIPAL PARTS OF TAFT-HARTLEY ACT

Special Provision	As Per Cent of Those Who Expressed Opinion: All Employes	Non-Union	Union Members	As Per Cent of Those Who Were Questioned: All Employes	Non-Union	Union Members
1.—60-day notice	83	91	74	78	85	70
2.—Suability	86	91	78	77	82	70
3.—Free speech for employers	74	83	64	69	76	61
4.—Union financial reports	89	90	88	86	87	85
5.—Anti-Communist union officers	81	82	80	76	76	77
6.—Anti-Fed. political contrib.	61	65	54	56	60	50
7.—Vol. check-off assg'nt.	79	80	79	68	63	74
8.—Anti-union shop by a minority	85	89	81	79	80	77
9.—Anti-closed shop	67	80	53	60	70	48
10.—Govt.-injunction to delay strike in vital welfare ind.	85	91	77	78	85	70
Average	79	84	73	73	76	68
Taft-Hartley Act as a whole	36	45	28	31	36	25

Unable to name correctly a single specific provision.....54 per cent of total
Able to visualize in concrete terms how law would affect him.....only a few

RESPONSES ON TAFT-HARTLEY ACT

Type of Workers	Per Cent of Total Interviewed	As Per Cent of Those Who Were Questioned: Should have Passed	Should not have Passed	As Per Cent of Those Who Expressed Opinion: Offered no Opinion	Should have Passed	Should not have Passed
White-collar	29	40	45	15	47	53
Skilled	22	27	61	12	31	69
Other	49	27	56	17	33	67
Factory	41	24	60	16	29	71
Non-Manufacturing	59	35	50	15	41	59
Union members	48	25	64	11	28	72
Non-union members	52	36	44	20	45	55
Men	73	33	55	12	38	62
Women	27	25	51	24	33	67
21-29 years	34	27	52	21	34	66
30-44 years	42	30	60	10	33	67
45 and over	24	38	45	17	46	54
Roosevelt voters	51	24	62	14	28	72
Dewey voters	19	58	32	10	64	36
All others	30	24	55	21	30	70
Plant under 20 employes	32	33	57	10	37	63
" 20- 29 employes	17	28	49	23	36	64
" 100-499 employes	16	28	52	20	35	65
" 500 and over	35	31	54	15	36	64
Total all workers questioned	..	31	54	15	36	64

Further Changes Needed in Labor Code

The recommendations of the American Mining Congress as to what should be included in a sound code of Labor Relations were not unique with our organization. In fact, they coincided in most cases with recommendations of other industrial organizations and many impartial expert witnesses who testified before the Congressional committees. A large percentage of the recommendations have now been written into law. Our program must not cease here. The remainder must be carefully planned and prosecuted just as vigorously as before until the whole job is done in a most satisfactory manner—satisfactory not only to manage-

ment but also to the working force in the mining industry, so that we can look forward to a long period of peaceful and profitable relationships.

Analysis of the Labor-Management Relations Act, 1947, is necessary to ascertain what has been accomplished and what remains to be done to have a sound code of labor relations.

The objectives of the act, the means provided in the act to accomplish the objectives are briefly given in this paper.

Purposes and Policy of Taft-Hartley Act

The high purposes and policy of the act to equitably safeguard the interests of employes, employers, unions and the public are clearly stated in the preamble of the act as follows:

"to prescribe the legitimate rights of both employes and employers in their relations affecting commerce,"

"to provide orderly and peaceful procedures for preventing the interference by either with the legitimate rights of the other,"

"to protect the rights of individual employes in their relations with labor organizations whose activities affect commerce,"

"to define and proscribe practices on the part of labor and management which affect commerce and are inimical to the general welfare,"

"to protect the rights of the public in connection with labor disputes affecting commerce."

There is still a National Labor Relations Act; the Wagner Act has not been repealed, but it has been amended. Section 101 of Title I commences: "The National Labor Relations Act is hereby amended to read as follows:" There then follows in quotations the National Labor Relations Act as amended. Amendments are made to each of the sections of the old act. The section number and topic of each section remains the same from Section 1 through Section 13. Section 14, excluding supervisors from the act, is a new section. Sections 14, 15 and 16 of the old act are re-numbered as 15, 16 and 17. The sections in the amended act are:

Sec. 1. Findings and Policy.
Sec. 2. Definitions.
Sec. 3-6. National Labor Relations Board.
Sec. 7. Rights of Employes.
Sec. 8. Unfair Labor Practices.
Sec. 9. Representatives and Elections.
Sec. 10. Prevention of Unfair Labor Practices.
Sec. 11. Investigatory Powers.
Sec. 12. Offenses and Penalties.
Sec. 13. Right to Strike.
Sec. 14. Supervisors Excluded from Provisions of Act.
Sec. 15. Conflict of Laws.
Sec. 16. Separability of Provisions.
Sec. 17. Short Title.

NLRA Sec. 7 Amended to Constitute Rights for Individuals Instead of Unions

The heart of the National Labor Relations Act in its original and amended form is Section 7. Section 7 of the original act continues in identical language in Section 7 of the amended act with the addition of a positive statement of a corollary right which, although it existed by natural construction of the old act, was ignored by unions and by the board. It is the right of an employe to refrain from union membership and activities. Section 7 of the new act with the added portion italicized for emphasis reads as follows:

"Section 7. Employes shall have the right to self-organization, to form, join, or assist labor organizations, to bargain collectively through representatives of their own choosing, and to engage in other concerted activities for the purpose of collective bargaining or other mutual aid or protection, *and shall also have the right to refrain from any and all of such activities except to the extent that such right may be affected by an agreement requiring membership in a*

LABOR MANAGEMENT RELATIONS ACT, 1947, TABULATION OF PRINCIPAL POINTS SHOWING PRIMARY BENEFICIARIES

Designation in Act (Section)	Brief Description of Provision	Benefit Accrues Primarily to Employe	Employer	Union	Public
3, 4, 9, 10	Provisions insuring fairer administration of NLRA				x
7	Individual employe has right to join union or refrain from joining	x			
7	Individual employe has right to engage in or refrain from concerted activities	x			
8	Employer may not interfere with rights granted employe by Act	x			
8	Employer may not dominate or interfere with union			x	
8	Employer may not discriminate because of union membership			x	
8	Employer may not discriminate because of charges or testimony by an employe	x			
8	Employer may not refuse to bargain with union			x	
8	Union may not coerce employer into joining employer organization		x		
8	Union may not coerce an employe in exercising his rights	x			
8	Closed shop prohibited and union shop allowed under some conditions	x			
8	Union may not refuse to bargain with employer		x		
8	Union may not use "boycott-strike" or "work-jurisdiction" strike				x
8	Union may not exact pay for no work		x		
8	Right of free speech is protected for unions, employes and employers	x	x	x	
8	Rules for collective bargaining prescribed for unions and employers		x	x	
9	Union is exclusive bargaining representative for all in bargaining unit			x	
9	Individual has right to handle own grievance	x			
9	Craft and professional employes have right to separate bargaining unit	x			
9	Plant guards may not be grouped with other employes in a bargaining unit		x		
9	Employes and unions may petition for union certification or decertification	x		x	
9	Employer has restricted right to petition NLRB		x		
9	Independent, CIO and AFL, unions must be treated alike by NLRB			x	
9	Representation elections may not be held oftener than once a year		x		
9	If no majority vote received, two highest choices have run-off election	x			
9	Only employes working or entitled to reinstatement may vote in Board elections	x			
9	Unions must file financial statements and furnish same to members	x			
9	Non-Communist affidavits by union officers are requisite for Board action	x	x	x	x
10	Unfair labor practice complaints more than six months old may not be filed		x	x	
10	Unions and employers are both liable for back pay awards for discrimination	x			
11	Board may not require reinstatement of individuals discharged for cause		x		
13	Right to strike unimpaired except as specifically provided in Act	x			
14	Foremen are not considered to be in category of employes		x		
202	Independent Federal Mediation and Conciliation Service is created				x
206 to 210	Cooling off period for industry-wide strikes creating National Emergency				x
301	Unions are made suable as entities and responsible for acts of agents		x		
302	Employer may not pay money to employe representative except as Act permits			x	
302	Protective restrictions placed on Welfare Funds for benefit of employes	x			
304	Unions may not use funds for political contributions in national elections	x			x
305	Government employes may not strike				x
401	Joint Congressional Committee on Labor-Management Relations is established				x

labor organization as a condition of employment as authorized in Section 8(a) (3)." (Section 8 (a) (3) deals with the union shop.)

During the period of the rapid growth of unions to giant size under the labor policy of the board and the "carte blanche" given to unions by the Norris-LaGuardia Act, Section 7 was applied by the board and looked upon by the unions in many instances as giving the unions the right to forceably organize workers and conduct concerted activities outside of any legal or moral law and by such means as the union saw fit. In such a situation the individual's rights were ignored and Section 7 was perverted. It became obvious that reform and reorientation were necessary if Section 7 was to constitute a statement of rights for individuals and not for labor barons. Raymond Moley says: "New Dealers won many elections by calling the Wagner Act the Magna Charta of labor. Taft has spoken of his act as labor's bill of rights. This historical point is well taken. The Magna Charta was pro-baron. The Bill of Rights, nearly five centuries later, was pro-commoner."

Four Beneficiaries Under the Act

Employes, employers, unions, and the public are the four groups whose rights and relationships are recognized in the Act's Declaration of Policy.

The major provisions of the act and the group or groups receiving the primary benefits of such provisions are shown in the tabulation on the opposite page.

Although many of the provisions shown are also of secondary benefit to the other groups, we have not attempted to so indicate in the tabulation. The public of course is a beneficiary, directly or indirectly, in every provision. In some cases there are groups which receive equal benefits from a provision as, for example, the attempt to eliminate Communistic control. We suggest that each reader make his own determination as to the beneficiaries and properly weigh their relative importance.

Practices Remaining to Be Corrected

Major reforms sought in H. R. 3020 were compromised out of the joint conference committee bill finally enacted as the Labor-Management Relations Act, 1947. The business of completing a sound labor code compatible with our free economy will not be finished until these major reforms are enacted into law.

The following tabulation shows which of the points of the program of the American Mining Congress were included in H. R. 3020 as passed by the House and which of them are in the Labor-Management Relations Act, 1947.

The reforms compromised out by its joint conference committee indicate that Congress has deferred the big task of solving major problems in at least six continuing practices:

(1) denial, to the minority in a bargaining unit, of participation in the pre-strike ballot;
(2) industry-wide bargaining and industry-wide strikes;
(3) exemption of unions from the anti-trust and monopoly laws;
(4) terrorism as a union weapon;
(5) infringement of the right to work;
(6) encroachments by unions on the employer's right to manage his business.

Another major problem is the completion of the program of purging the Communists from the labor unions which they control or influence.

These major problems were studied by the House Committee on Labor, which reached the conclusion that each of these problems must be solved if we are to maintain our system of a free economy. To this conclusion, we agree. The House Committee on Labor prepared a comprehensive and effective labor code which was known as H. R. 3020 or the Hartley Bill. This Bill intelligently and courageously dealt with these six major problems and passed the House by a 74 per cent affirmative vote. However, a number of the provisions in the House Bill, which were not contained in the extremely mild bill recommended by the majority report of the Senate Labor and Public Welfare Committee, were not included in the compromise bill drawn up by the Joint Conference Committee.

(To be concluded in January)

12-Point Program of the American Mining Congress Western Division	Points Covered in H. R. 3020	Points Covered in Labor-Management Relations Act, 1947
1. Prescribe procedures for true collective bargaining.	Covered except for a timetable for cases of initial contract.	Covered except for: pre-strike secret ballot; timetable for cases of initial contract.
2. Prohibit industry-wide bargaining and industry-wide strikes.	Covered.	Not prohibited but condoned. Even in national emergency cases, such bargaining is permitted and striking only delayed.
3. Make unions subject to Anti-Trust Laws.	Covered.	Not covered but secondary boycotts made unfair labor practices.
4. Make unions suable as legal entities.	Covered.	Covered.
5. Outlaw mass picketing, violence and intimidation.	Covered.	Could be construed as unfair labor practice but adequate remedy not provided.
6. Recognize and prevent unfair labor practices by unions.	Covered.	Covered but in some cases without adequate remedy as in 5.
7. Provide equal employer and employe freedom of speech in matters of unionization, bargaining negotiations, strikes and anything else.	Covered.	Covered.
8. Provide that NLRB findings be based on a preponderance of relevant evidence.	Covered.	Covered.
9. Protect the rights of employes as individuals to work regardless of membership in a union.	Partially covered.	Covered except that up to 49 per cent of a unit could be compelled to join a union not of their choice.
10. Prohibit employer-union negotiated "welfare funds" or any other payment by employers of money to unions, except through authorized payroll deductions.	Covered.	Welfare funds regulated; check-off of dues permitted only if authorized by the individual.
11. Declare that foremen as well as other supervisory, professional and administrative employes are not covered by NLRA.	Supervisory and confidential employes exempted.	Supervisory employes exempted, professional employes not exempted.
12. Exclude as improper subjects of collective-bargaining proposals encroaching on the employer's right to manage the business.	Covered.	Not covered.

Program committee in session at Pittsburgh

PROGRAM OUTLINED For 1948 Coal Convention

THE 1948 Annual Coal Convention of the American Mining Congress is to be a three-day meeting—April 26, 27, 28—at the Netherland Plaza Hotel, Cincinnati. In accordance with the policy to hold the Exposition every second year, the 1948 meeting will be a convention only, without exhibits of equipment, but the industry may be assured that the program will maintain a high standard of service which no mining man can afford to miss.

The Program Committee, under the chairmanship of T. G. Gerow, Executive Vice President, Truax-Traer Coal Co., with the personnel as listed below, met at the William Penn Hotel, Pittsburgh, on November 17 to make plans for the convention and to select the subjects to be presented at the sessions. Serious consideration was given to determining what questions are of greatest import to coal mining men today, and the committee drew up plans to provide a comprehensive coverage of a wide range of mining problems.

A general session will be held on each morning of the convention, dealing with problems of wide interest to the entire industry, while on each afternoon there will be two or more concurrent sessions to present papers and discussions on specific phases of deep mining and strip mining. The concurrent sessions covering diverse subjects will be scheduled so as to permit every man present to arrange his time to hear the papers on those operations in which he is most interested.

Luncheon meetings will be held on Monday and Tuesday, at which outstanding speakers will address the industry. On Monday and Tuesday evenings there will be informal entertainment, and the convention will conclude with the Annual Dinner on Wednesday night.

The selection of the subjects and speakers for the program is now under way and further announcement will be made in an early issue of MINING CONGRESS JOURNAL.

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An Automatic Derail and Trip Position Indicator*

Hazards to Workmen Operating a Derail on Slopes Are Eliminated When This Ingenious Automatic Electric Device Is Used. This Installation Has Been Applied Successfully for Some Time at the Heidelberg Coal Company's Operation at Avoca, Luzerne County, Pa.

By JOSEPH V. MATHER
Mining-Explosives Engineer
Health and Safety Branch
Bureau of Mines
Wilkes-Barre, Pa.

DERAILS on inclines have been used advantageously both on the surface and underground. Some of the derails in use are of the hand-operated type, while others are semi-automatic; that is, they are held in the open position by a spring and must be closed manually, but in each instance a workman must be available to operate the derail. The hand-operated derail is not satisfactory when an emergency arises, as too often no one is present. To minimize the hazard at the derail and to reduce the cost of providing a man to operate it, the Heidelberg Coal Company installed an electrically operated derail that is controlled by the hoisting drum, which also operates the electric light trip-position indicators. Red and green lights mounted on a pole nearby show the operator of the hoist the position of the derail; the light is red when the derail is open.

The hoist is operated by remote control by a workman who also operates the rotary dump. In order that the operator may visualize the trip position on the slope, a board 50 in. long and 4 in. wide, on which a series of miniature 115-volt lights is assembled is provided at the rotary-dump station. The lights indicate the trip positions on the slope at 15-ft. intervals; red lights indicate the top and foot of the slope, and amber lights indicate the curves so that extra precautions may be taken.

Installation and Operation

The electrically operated derail and trip indicator are installed as follows: A horizontal threaded shaft 66 in. long, 2 in. in diameter on two bearings which are supported on angle irons is mounted 3 ft. above the floor. A fiberboard carriage having a steel hub which is threaded on the horizontal shaft carries two electric contactors; one contactor operates the indicator lights, and the other causes operation of the derail. The segments for the lights and the derail control are mounted in a fixed position above the carriage. A sprocket on an extension of the threaded shaft is driven by a roller chain from the hoisting drum. In operation, the carriage moves forward or backward, depending upon the direction the drum is rotating, causing the light contactor to touch consecutively the individual light segments and, at the proper time, the contactor for the motor which operates the derail. Figure 1 shows the

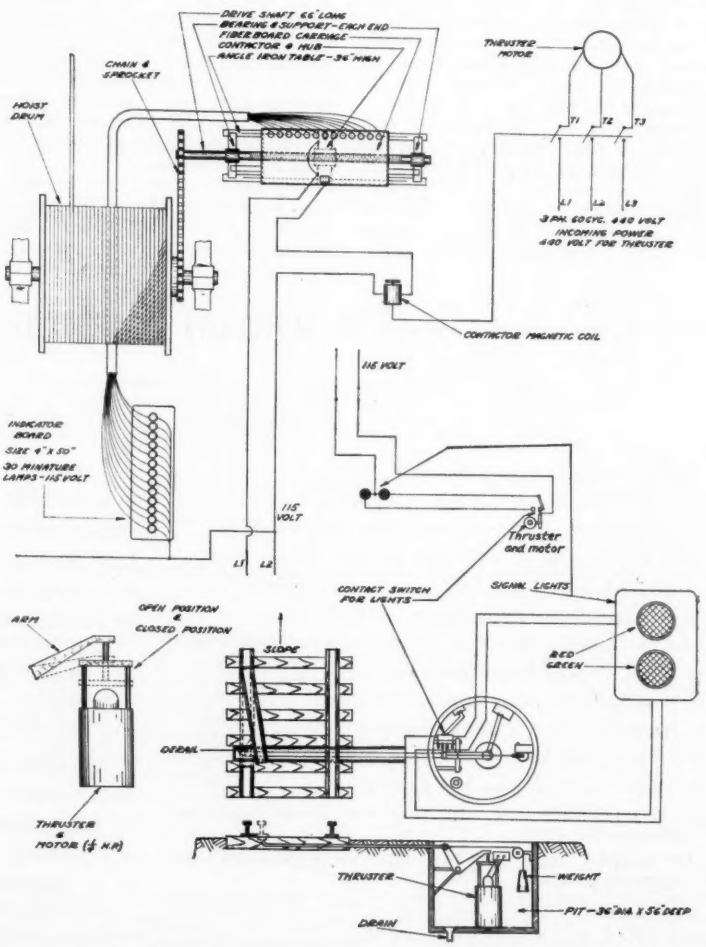

Fig. 1.—Electrical diagram, and section showing the derail operation

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Fig. 2. The threaded shaft, the carriage, contactors and segments

Fig. 4. A circular steel-lined pit, the thruster, light contactor, and a weight used to keep the derail in open position in case of mechanical failure

Fig. 3. The ¼-hp. 440-volt 3-phase 60-cycle motor mounted on top of the thruster. Rods of thruster are in extended position

electrical diagram of the circuits for the lights and derail. Figure 2 shows the threaded shaft, the carriage, and the contactors and segments.

The contactor for the derail is similar to those for the lights, except that it energizes a relay that closes the electric circuit to the ¼-hp. motor of the thruster. Figure 3 shows the ¼-hp., 440-volt, 3-phase, 60-cycle motor mounted on the thruster.

When the electric circuit of the thruster motor is closed, the thruster rods are extended and the derail is closed; when the electric circuit is open, the thruster rods recede, thus opening the derail. Weights are attached to the bridle bar of the lead rail to assist the thruster in opening the derail and to hold the derail in the open position if mechanical or electrical failure should occur.

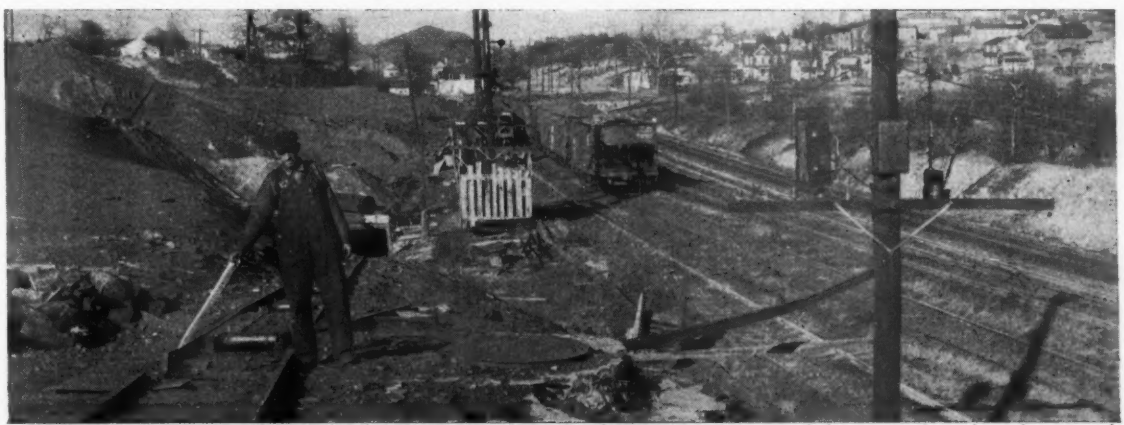
The operating equipment at the derail is in a steel-lined pit 56 in. deep and 36 in. in diameter, as shown in Figures 1 and 4. A light-switch contactor mounted on the throw bar to the derail energizes either the circuit for the green signal light when the derail is closed or the red light which shows that the derail is open. Figure 5 shows the derail in the open position and the red and green lights mounted on a pole.

When replacing the hoisting rope, or when cutting off or resocketing it, an adjustment must be made on the indicators. This is accomplished by stopping the hoist when the end of the rope is at the derail and moving the carriage until the contactor touches the derail segment. Four cars are normally transported at one time; but in the same manner, the adjustment can be made to accommodate longer or shorter trips, as desired.

This piece of equipment indicates what can be done to promote safety in the operation of derails. Obviously, a derail of this type installed at the top or foot of a slope eliminates the hazard to the workmen who must close the conventional-type derail for descending trips.

Acknowledgments

The author wishes to express his gratitude to the officials of the Heidelberg Coal Company for their assistance in securing this information and granting the permission for its use. Special acknowledgment is given to John McDade, general manager, and Joseph McDade, superintendent.



The derail in the open position; pit for the operating equipment in the rear; red and green lights mounted on the pole are used to show the position of the derail

Hard Materials for Rock Bits

PART II

Completing a Review of the Use of Hard Materials for Rock Bits, the Author Describes in Detail the Various Tests Used in the Development of a Tungsten Carbide Insert Bit

By R. W. ADAMSON
Ingersoll-Rand Company

Re-sharpening of Bits

THE point at which a steel bit requires reconditioning should not be used as an indication of when a tungsten carbide bit should be resharpened. In practically all cases, the latter can be run with considerably more flat on the cutting edge without appreciable loss in drilling speed.

Any pedestal or bench grinder is suitable, providing it will carry on 8-in. diameter by ½-in. or ¾-in. wide grinding wheel at a speed of 3,000 to 3,600 rpm.

No known comparative sampling or dust counts have been recorded for drilling with insert bits and steel bits under identical conditions. A number of comparative screen analyses of the cuttings from holes drilled with steel bits and insert bits show several times greater volume of the steel bit cuttings which will pass 200-mesh screens.

"Spot Test" Data

The data which follow are extracted from recent reports and field observations of "spot tests" of the insert bit. Permission to identify the operations has not been obtained. As is usually the case in tests of this type, the data are not complete, but are believed to be representative and honestly reported.

Drilling in a Hard Silicified Sedimentary Formation in Mexico

A 3-in. drifter with 1-in. qt. oct. steel. Two of these bits drilled 180 ft. each at an average drilling speed of 15 in. per min. before insert failure. Bits were resharpened once.

In the same formation a 3½-in. drifter with 2⅛-in. steel starter bits drilled an average of 1.8 ft. before dullness, at an average rate of 8.3 in. per min.

Large Gold Mine—Western United States

Drilling hard quartzite, 3½-in. anvil block chuck drifters, 100 lbs. air pressure at the drill, the bits averaged only 14-ft. before tip failure. A 2⅝-in. jackhamer with the insert bit drilled approximately 70-ft. at an average speed of 11 in. per min. The bit was resharpened twice. Steel bits with the 3½-in. drifters averaged 10 in. per min. Starting size 1¾ in.; bottoming size 1½ in. Due to the high air pressure, steel bits could be run 2 ft. but would "gauge out" and occasionally bind in the hole after 1 ft. of drilling.

In the siliceous ore at this property four of the new bits drilled an average of 88 ft. on a 3 in. drifter with the same high air pressure, before insert failure. Two of the bits were sharpened once. Drilling speed was approximately 20 in. per min. Steel bits with 1¾ in. starters averaged approximately 14 in. per min. and were seldom used for more than one 30-in. run. One bit used with the 2⅝-in. jackhamer drilled over 200 ft. at an average drilling speed of 17 in. per min.

Drilling in Hard Minnesota Iron Ore

1⅝-in. steel bits drilled slightly less than 1-in. before discard dullness at a rate of slightly less than 1 in. per min. on a DA-30 drifter (3 in. bore) using 1⅛-in. round steel.

A "Carset" bit on the same machine and steel section drilled over 100 in. at a rate of 4.2 in. per min. Several inserts were fractured at the end of the run, and the bit had not been resharpened.

In the same rock, a J-50 jackhamer (2⅝-in. bore) drilled 50 in. at a rate of 6.8 in. per min. The bit was dull and a need for resharpening was indicated. Ultimate total drilling life was not determined.

In the same test "greenstone" wall rock was drilled with the 3-in. drifter and steel bits at an average rate of 12 in. per min. Starting size 2-in., finishing size 1⅝-in. Average distance drilled before dull was 30 in. Three tungsten carbide bits drilled over 300 ft. each, at an average drilling speed of 16 to 17 in. per min. The bits were resharpened three times.

It is recommended that bits be held in the bare hand while grinding

Sandstone Conglomerate Pennsylvania Anthracite entry contract

DA-35 power-feed drifters on jumbo mounting, 1¼-in. H. R. alloy steel. Six bits averaged 210 ft. each. Test

continuing. No breakage of either steel or bits. The bits were sharpened once up to this point; average gauge loss 0.050 in. Steel bits in this formation are seldom used again without resharpening after a 30-in. run. No comparison of drilling speeds given. Dynamite saving for an 8-ft. round given as 40 lbs. with insert bits. One chuck tender for two miners required with insert bits. Two chuck tenders required with steel bits.

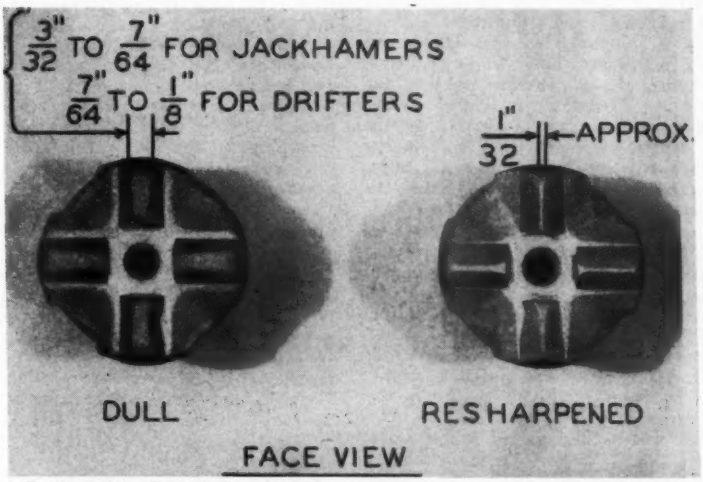
Pennsylvania Trap Rock Quarry

Holes about 5 deg. below horizontal, 30 ft. deep drilled with X-71 (4-in. bore) wagon drill. Five changes 1¼-in. H. R. carbon steel. Wet drilling. Ten holes, 300 ft. total, drilled in less than two shifts. The five insert bits and rods were intact. Test continuing. Bits after 60 ft. of drilling did not need resharpening. At times it was necessary to run at reduced throttle with the insert bits to avoid plugging as a result of erratic and reduced water pressure. It is believed dry drilling, which was not permitted, would have been more satisfactory under the prevailing conditions. The holes were sprung and loaded with 300 lbs. of 1¼-in. dynamite without difficulty.

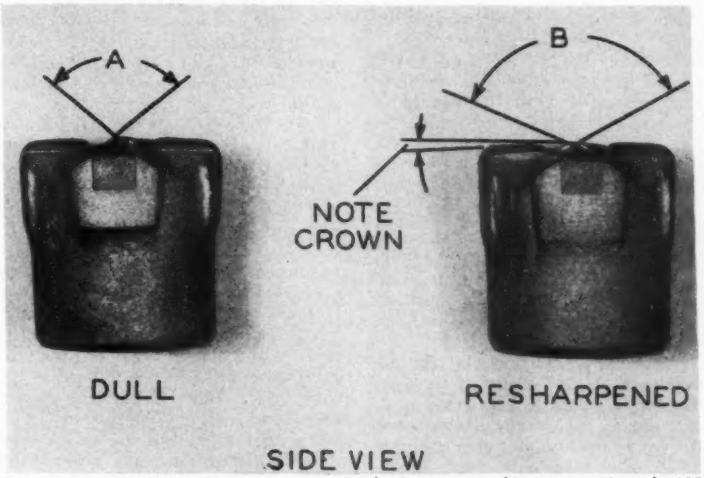
When drilling with forged steel, 3¼-in. starters and 1½-in. finishers are used. An average of one shift is required to drill one hole to a maximum depth of 22 ft. The average number of steels required is not given.

New England Trap Rock Quarry

Holes drilled to 12 ft. with X-71 wagon drill and steel bits, which drill a maximum of 20 ft. per run. An insert bit on an 18-ft. 1¼-in. H. R. steel finished 42 holes from 12 to 18 ft. deep, for a total of 252 ft. before insert failure. The bit was resharpened twice. Drilling speed not taken, but reported as several times faster than the steel bit.



Cutting edge after grinding should have a flat crown remaining of approximately 1/32 of an inch



Angle A on a new bit is approximately 105 degrees. In regrinding this should be increased to as much as 120 degrees, thus preventing premature removal of steel which supports the carbide insert

Only light pressure should be used against the wheel

New England Granite Quarry

Plug and feather drilling:

1⅝-in. forged steel bit drilled 19-in. holes at 6.2 in. per min.

1⅝-in. steel bits drilled 19-in. holes at 6.3 in. per min.

1½-in. insert bits drilled 19-in. holes at 11.3 in. per min. Holes drilled with insert bits entirely satisfactory for use with plug and feather tools.

The point at which this bit requires resharpening is determined by watching the cutting edge and drilling speed. The bit is usually considered dull when the cutting edge has a flat of 3/32 to ⅛ in.

In general, the resharpening will be on the cutting edges only because under most rock conditions, the gauge

wear is such that the gauge surfaces do not need reconditioning.

It is recommended that the bit be held in the bare hand while grinding. Use only light pressure against the wheel. Excessive pressure causes rapid grinding wheel wear. If the bit cannot be comfortably held in the hand, too much pressure is being exerted against the wheel. Excessive pressure does not increase the grinding speed, but it may cause damage to the carbide insert.

The bits are square across the cutting edges when new. In resharpening the bit will require more grinding on the outside portion of the cutting edges because of the naturally greater wear at these points, and it is advisable to slightly "crown" the bit in resharpening.

The cutting edge angle of a new bit is 105 deg. For drilling most formations this can be increased in the grinding operation to approximately 120 deg. Both sides of the tip should be ground, leaving a flat of approximately 1/32 in. on the cutting edge.

No coolant should be used during the grinding operation.

An average of 7 to 10 bits can be sharpened per hour. It is an ideal job for an incapacitated person.

Performance Conclusions

The leading interest of most operators in insert bits concerns the comparative cost of drilling with them. This can be determined at this stage of the development only by a thorough test under the actual operating conditions.

The following conclusions are advanced as a guide for use of the 1½-in. diameter, 4-point. The drawing of conclusions is precarious when one is privileged to possess as paper weights two dull steel bits, both used in efficient practice, one of which drilled one-half of an inch in specular hematite and the other 500 ft. in limestone.

(a) It will probably be found that a 2⅝-in. bore machine with the "carset" bits will drill faster than a drifter with the usually larger diameter steel bits used with them. The extra "throttle" time gained from the flexibility and worker appeal of the lighter equipment should be appreciable. However, there are many formations, similar to granite, which can be successfully drilled with 3½ and 4-in. bore drifters, wherein economical bit life will be obtained, together with proportional and sensational increases in drilling speed over that of the established steel bit practice. If the formation is soft enough to permit over-penetration of the bit, rough rotation and premature failure of the insert, connection or drill rod can be predicted. Conversely, when drilling other formations, mostly those highly resistant to drilling, there is a danger of reactive stresses resulting in premature insert failure. In such cases a smaller bore machine would be indicated.

Under the heading, "Spot Test Data," are noted the results of the only two known tests of bits on X-71 (4-in. bore) wagon drills in hard rock. It was predicted that the applications were impractical, and the surprise at the successful performances was genuine.

Again, testing under actual conditions is the only reliable guide at this stage of the development.

(b) In drilling formations where steel bit usage before sharpening averages 2 ft. or less, a rule of thumb is taking form, wherein it would be predicted that this bit should drill 100 times farther in total life. That is, if a steel bit requires sharpening after drilling 1 ft., the bit should drill 100 ft. On this basis the cost of 100 steel bit usages is one of the factors which determine its economical use. Indirect savings which occur from the use of these bits must be determined for each operation. It is further hazarded that the harder the rock the greater should be the ratio in favor of the insert bit, provided the selection of the rock drill is correct.

(c) The foregoing conclusion also applies to the relative drilling speeds. The softer the rock and the more comparable the average bit diameters, the less will be the differential. In an average operation 35 per cent over-all increase in drilling speed would be predicted. This will range up to several hundred per cent increase for formations highly resistant to drilling.

(d) It cannot be predicted at this time what percentage of the total drilling might be economically done with insert bits. Borderline applications and critical conditions in the softer formations have been observed, wherein a steel bit usage prior to dullness was 5 to 10 ft., and insert bit life only 150 to 200 ft.

(e) Another precept taking shape is that operating economies can be effected by a combination use of steel and insert bits on the same job.

(f) Five operations are known to have used the insert bits with rotating stopers. Two of them report relatively short total life. The other three report satisfactory performance.

Results of a Mine Test

The Balmat and Edwards mines of the St. Joseph Lead Co. have cooperated in testing the insert bit in phases prior to its commercial release, and with bits of the present performance standards. Sixteen of the latter bits were tested, and the following data was extracted from a company report.

The bits were tested under a wide variety of mine conditions, drilling holes to 7½-ft. depth. Eight bits were used with 3-in. power-feed drifters; three with 60-lb. mounted jackhamers; and 5 with 100-lb. rotating stopers. Steel bits were used interchangeably with the same connecting medium on 1-in. hexagon steel, as a standardizing factor. The averaged final results were as follows:

Rock Drill	Average total footage per Insert Bit	Equivalent No. of steel bit usages
60-lb. jackhamer	541	164
3-in. drifter	405	124
100-lb. rotating stoper	122	46

The rock drilled consisted mostly of silicated limestones with pyrite content up to 30 per cent, sphalerite up to 25 per cent, some serpentine, talc, mica, tremolite, etc.

It is estimated for an over-all mine average the insert bit would drill 25 to 30 per cent faster than the steel bit.

The 60-lb. mounted jackhamers were found most suitable for use with the insert bit from a standpoint of total drilling life. The three bits tested with them were discarded because of loss of gauge, which averaged 0.20 in.

Five of the eight insert bits used with the 3-in. drifters were discarded as a result of insert failures; two bits were lost in the hole, and one was discarded because of thread wear.

The life of the bits on the stopers were unsatisfactory. Of the five bits tested, two were discarded because of insert failures; two with broken bodies; and one from discard size gauge loss.

The bits used in the test were resharpened on silicon carbide wheels from one to five times, depending on the life of the bit and the conditions of drilling.

The report makes note of an interesting property of the small, uniform-diameter-hole resulting from the insert bit. Removal of the drill steel from holes of steep downward inclination was accomplished with appreciable saving in time as opposed to the tapered holes drilled with steel bits. The reason is advanced that the heavy sulphides and other cuttings are more completely removed by the increased water velocity in the reduced clearance between the drill steel and the drill hole. This desirable cleaning characteristic of a nearly uniform diameter hole has been noticed in surface dry drilling with these bits on other tests.

A Shaft Contract

Results of the use of these bits on a contract shaft sinking job at Copperhill, Tenn., by Salmon & Cowin,

Inc., are noted. The shaft is circular and 13-ft. in diameter. An extremely resistant to drilling, massive, white quartz was encountered and it was anticipated most of the work would continue in it.

Hand-held, 60-lb. jackhamers with 1-in. hexagon steel, and 2-in. starting size detachable steel bits were in use with good air pressure. It was practical to drill only a 4-ft. round, during which an average of 250 bits were dulled drilling 30 holes. Eight or nine bits were required for each 4-ft. hole and the drilling speed averaged 3 in. per min. An average of two reconditionings, total of three usages, was obtained per bit. The bit cost was roughly, 15 cents per bit usage, or $9 per foot of shaft.

The "Carset" bit was tested and approximately twelve 6-ft. rounds have been drilled with it. The depth of a round was increased from 4 to 6 ft. Eight-ft. rounds were drilled, but did not break satisfactorily. The drilling speed with the insert bit averaged approximately 10 in. per min. Its average life was 60 ft. of drill hole, which represents an average of three bits expended for each 6-ft. round. At $12 each, this represents $36, or a cost of $6 per foot of shaft for insert bits.

Savings in labor are as follows:

Using steel bits

Seven-man crew required 14 hours to drill 30-hole, 4-ft. round. Cost of drilling labor per ft. shaft advancement, $32.72.

Using Insert Bits

Five-man crew required 8 hours to drill 30-hole, 6-ft. round. Cost of drilling labor per ft. shaft advancement, $7.33.

Discarding of the bits was usually a result of wearing to skirt size, sometimes after 30-ft. of drilling. The average life of the alloy steel drill rod was approximately the same as the bit, or 60 ft. It is reported that time lost in recovering bits lost in the drill hole was negligible.

Acknowledgment

For valuable assistance in making the preparation of this paper possible, appreciation is expressed to:

D. W. Hart, Ingersoll-Rand Company, and P. W. Weiser, Carboloy Company, who are in charge of the respective technical staffs assigned to the development of the "Carset" bit; together with their associates.

R. J. Mechin, district manager, St. Joseph Lead Co., Balmat, N. Y., for permission to publish data extracted from a report covering an extensive test of the bits in the Balmat and Edwards mines.

R. G. Cowin, president, and John Coker, superintendent, of Salmon and Cowin, Inc., Birmingham, Ala., for permission to publish data from a shaft sinking job which presents a difficult drilling problem.

Tungsten Carbide Techniques for Rock Bits

Further Discussing Tungsten Carbide for Rock Bits, the Author Reviews the Problem of Insert Attachment and Bit Design. Conclusions Indicate That the Harder the Rock, the Greater the Economy Through Use of Tungsten Carbide

By PHILIP M. McKENNA
President
Kennametal Inc.

MR. ADAMSON'S article is in itself a recognition of another step now being taken in the use of carbide tool metal for mining. As a manufacturer of cemented hard carbide compositions starting with tungstic acid as one raw material, and cobalt oxide as another, and by processes differing considerably from those based upon German patents making carbide compositions used in processing the higher strength requisite for the more powerful machines, typical both of American metal cutting machine tools and of American mining tools, I welcome his contribution. About one-third of our particular company's production of carbide now goes into mining tools in the form of undercutter bits and rotary drill bits. Near here in New Mexico these undercutter bits are used in mines of three of our largest producers of potash. In the coal fields of Pennsylvania, Ohio, West Virginia, Kentucky and Illinois hundreds of thousands of these undercutter bits have played a large part in the mechanization of coal mining, achieving 20 to 100 times the tool life compared to the use of steel bits; not only has this been a reduction in bit cost per ton but economies made by keeping machines steadily at work without stoppage for frequent bit changes are an even greater factor of cost reduction.

Advantages in Percussion Drilling

Now it becomes apparent that in the field of percussion drilling equally great, if not greater economies are attainable by the use of rock drill bits employing blades of this same hard strong tool metal. There is some shock encountered in undercutter machine bits but not nearly so much as in percussive drilling. The brazed construction as shown in Fig. 1, when the brazing is done under carefully controlled conditions is sufficiently strong for work of a kind shown going on in Fig. 2. The steel bodies upon which the carbide tips are held are

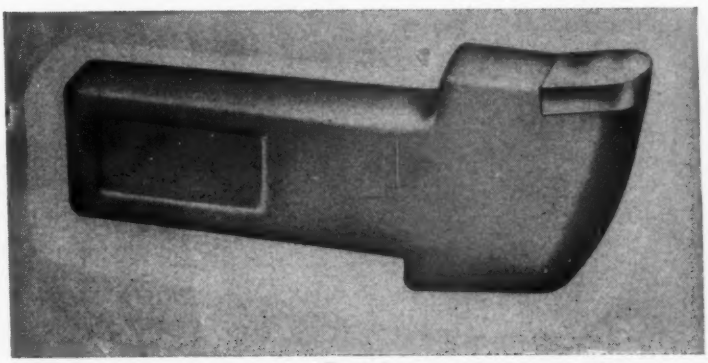


Figure 1

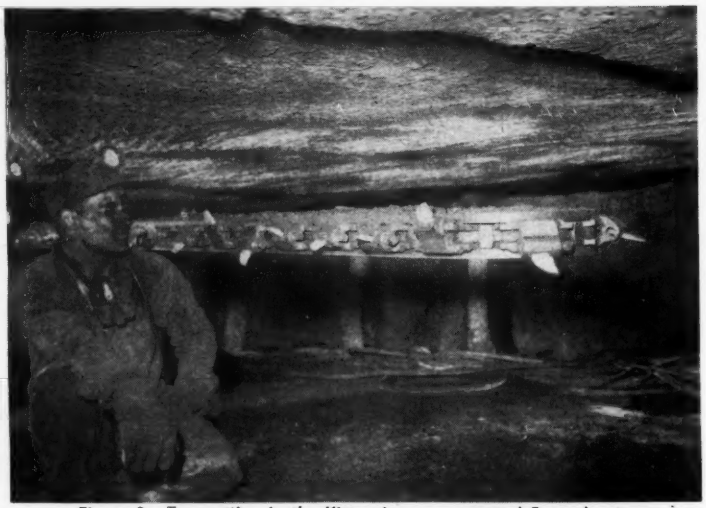


Figure 2. Top cutting in the Kittanning seam, central Pennsylvania

heat treated to a state where the hammer test as shown in Fig. 3 will slightly bend but not break the bit.

Mr. Adamson omits mentioning one of the physical characteristics of carbide which must be considered in the type of construction which he shows, namely its very low coefficient of thermal expansion. In the 12 per cent cobalt tungsten carbide composition it is 6.3 x 10.6 per deg. F. compared to 14.7 x 10.6 per deg. F. in .90 carbon steels. Now as research director of a tool steel company for a period of 10 years before I went into the carbide business, I tried many times to take the stretch and contraction caused by temperature charges out of steel. I finally gave it up as a bad job because steel was generally chiefly made of iron atoms which insisted upon carrying on their characteristic behavior when heated or cooled. Invar steels about 26 per cent Ni do not have a wide enough range since the coefficient of expansion is low. Thus in any brazed construction, temperature changes either in cooling from brazing or in subsequent heating and cooling in use, due to frictional heat, but strains upon the carbide, upon the steel to which it is attached, and upon the film of brazing material. Such strains are particularly detrimental in carbide tools which must withstand intermittent forces. Attempts to accommodate unequal shrinkage of carbide and steel and thus minimize such strains in brazed carbide tools are successful only within limits. While it is practicable to do this in tools having relatively small tips of carbide and shapes and sizes of shanks not likely to warp in cooling from brazing such strains in my experience should be avoided in tools to be subjected to intermittent shock. Let me illustrate how attachment of the carbide by mechanical means has so greatly increased the durability of carbide metal cutting tools. Figures 4 and 5 illustrate such tools which the unstrained carbide has proven its greater durability.

Blade Attachment Not Easy

Mr. Adamson states that "details of the best treating and brazing techniques of most manufacturers of insert bits are classed by them as trade secrets." To correct any impression which might be inferred from this, insofar as it is intended to apply to the "Kennametal Percussion Drill Bit" for drilling hard rock, I shall state publicly on this occasion that the construction which we have discovered, and which has now been tested within the past month, has proved to be eminently satisfactory. I admit that

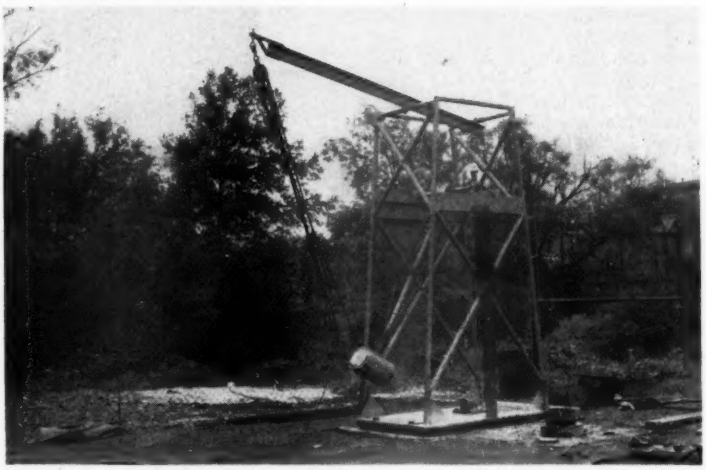


Figure 3. Testing hammer for mining bits

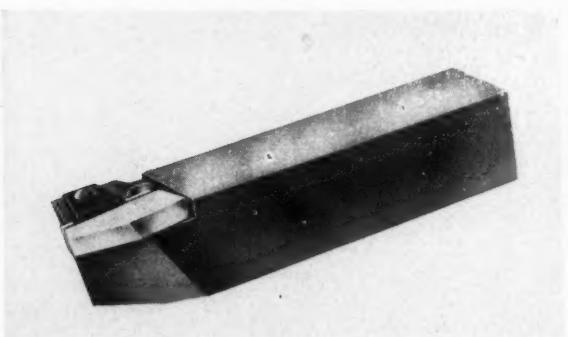


Figure 4

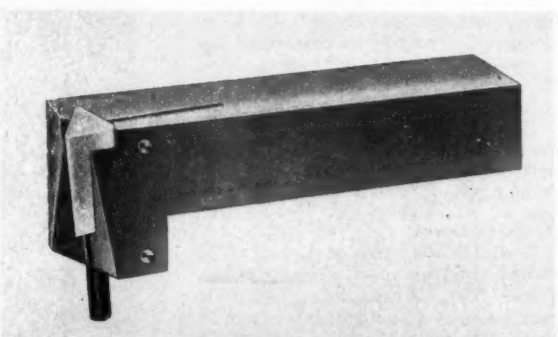


Figure 5

it is a new way to construct a percussion drill bit having a carbide blade to hold this carbide as shown in Fig. 6, solely by wedging and frictional hold and to adopt the proportions of depth of blade three or four times its width

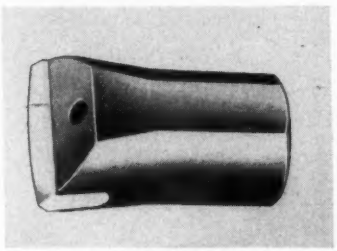


Figure 6

in such wedged construction instead of using brazing with any of the many expedients intended to minimize in brazing of carbide to steel. To prevent slippage of the carbide blade in the slot we have increased the frictional hold by the use of splintered fragments of carbide integrally attached on one of the large wedging surfaces of the carbide blade. This hold is so strong that when the carbide blade, having 2 deg. taper on a side, is forced into the accurately milled slot in the hardened bit body, 15 tons pressure on the blade at one of the open ends of the slot, in the direction of the other open end, does not budge it. Every bit we have made in this way and tested in the hardest drilling, including especially drilling in ganister, has shown the carbide blade to be secure.

1. The carbide bit is not stressed by warping encountered usually in brazed construction of metals of such differing thermal expansion rates; hence if experience in metal cutting tools of carbide counts for anything the carbide blade is more durable for resisting shock.

2. The bit body may be heat treated to the most desirable hardness, about 45 to 50 Rockwell C without conditions of best brazing temperature spoiling the steel.

This percussion bit drilled 370 ft. in red hematite ore, without sign of wear

3. The blade of carbide is proportioned so as to resist flexure beyond its elastic limit by reason of its own strength, not depending upon the steel with its much lower YME. to resist this flexure by supporting the blade. It rests upon a semi-cylindrical base with localization of strain into the slot with a semi-cylindrical bottom.

4. The blade is held by the grip of the autogeneously welded sharp fragments of carbide on one side of the carbide blade, effectually resisting movement along the slot.

The Harder the Rock, the Better the Drilling

As Mr. Adamson reports that the greatest economies are obtained in harder drilling where the best steel bits must be renewed in 2 ft. or less of drilling when 100-fold tool life is to be expected over steel bits; he further hazards the idea that the harder the rock, the greater should be the ratio in favor of the insert bit; that is if the construction is such that the bit can take the shocks without destruction on the first few blows. I can confirm Mr. Adamson's conjecture as entirely correct. One of these wedged bits has drilled in 1½ hours in ganister what required 2 days of drilling to accomplish the same results with steel bits. The drilling was so hard that only 3 or 4 in. could be drilled with a steel bit before renewal. The procedure with steel bits was to drill 8 in. and then blow the hole out with a light dynamite charge so that eventually when it was to the 12 ft. depth required the hole was conical and flared out to 2 ft. at the top. It took 175 sticks of dynamite by the old method but only 25 sticks as the hole was drilled with the bit I hold here in my hand. In addition to one 12 ft. hole this bit drilled 23 ft. of drilling in block hole work in this ganister.

You will note that this drill bit was attached by a threaded connection to the drill steel. I hold no brief for any particular method of attachment of these carbide drill bits—threaded connection with the drill steel firmly pressed against the base of the skirt, taper to taper properly made, or even pressure-welded connections can be used.

At present the simplicity of the single chisel type recommends itself. The cutting behavior of carbide is such that freer and faster cutting is done and we have not experienced "rifling" as might occur if single chisel bits of steel were used. The cutting is 2 to 3 times as fast per minute with this bit as with 4-bladed steel bits. I am surprised that the speed of drilling is not higher than reported by Mr. Adamson in his "spot test" data.

Undoubtedly Mr. Adamson's article will excite the greatest interest in carbide percussion drilling and has added greatly to our experience in this very rapidly advancing phase of mining.

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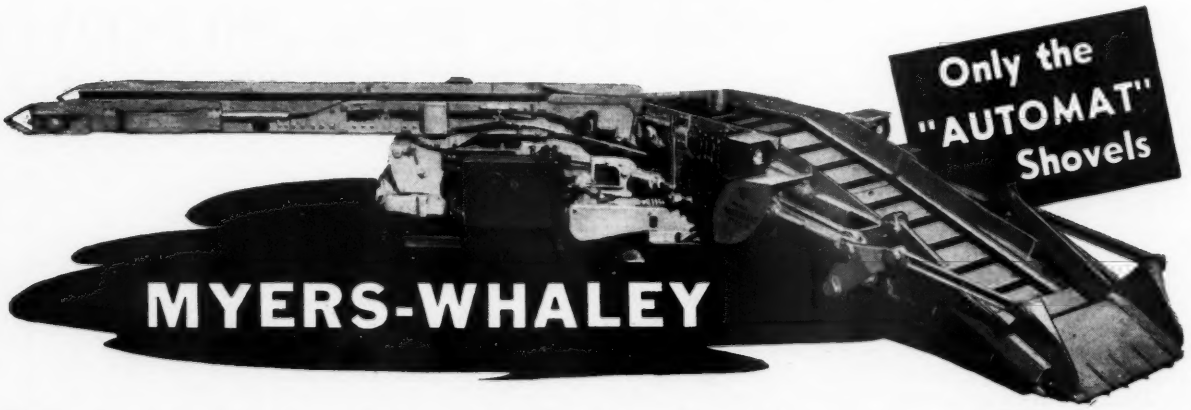

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Operators and Manufacturers discuss the Committee Reports

Annual Conference of the Coal Division

Committees Meet for Open Discussion of Reports on Important Phases of Coal Mine Operation

A large group of coal operators and manufacturers, representing the major coal fields, met in the Annual Conference of the Coal Division at the William Penn Hotel in Pittsburgh on November 18th. This was the first real get-together of the Division since the War and both the morning and afternoon sessions, as well as the luncheon meeting, were marked by a constructive interest on the part of all those present.

At the luncheon, Julian D. Conover, Secretary, American Mining Congress, presided, opening with the reminder that this was the "Lucky Thirteenth" Annual Conference of the Division. After referring to the Committees' fine work on the operating problems of the coal industry, he gave a brief over-all picture of the legislative outlook for the current special session and the forthcoming general session of Congress, dealing especially with those matters which are of particular concern to the coal industry. He said that the special session of Congress would send legislation to the White House extending immediate emergency aid to Italy, France and Austria. The President's proposals to curb inflation domestically, he stated, stunned Congress and while its leaders are on record as opposing any return to wartime price and wage controls, they may be expected to support some measure of control over consumer credit, rents, and exports as well as curbs on speculation in the commodity market. He emphasized that Congress will closely study any proposals to reimpose strong allocation and distribution controls on coal and other basic commodities.

Turning to the forthcoming regular session of Congress in January, Mr. Conover pointed out that this will likely end early in June due to the fact that both parties are holding political conventions. Although the long range program for European recovery will be considered first, he felt that the agenda will include consideration of tax reduction, stream pollution, the St. Lawrence waterway, and reciprocal trade agreements. Considerable pressure is being exerted by union leaders for repeal of present labor legislation, but he thought it was not likely that Congress would act on these matters at the regular session, as the labor law authors have asked that the legislation be given a fair trial before amendments are undertaken. Mr. Conover concluded by urging that coal operators and manufacturers keep their legislators informed on all matters that touch upon the industry's problems so that Congress may act intelligently when such measures are considered.

Harry M. Moses, President, H. C. Frick Coke Company, and Chairman of the Coal Division, paid a high compliment to the work of the American Mining Congress and expressed his deep appreciation, on behalf of the coal industry, for the work which the committee members have done. He stated that the coal industry is no longer characterized as "backward," but is now definitely recognized as having reached the level of other American industries in the matters of safety, labor relations, wages and production efficiency. He further

stated that the Committee reports constitute the final word on operating problems and that there was no other place where the information which they furnish is available. Coal operators and manufacturers, he said in conclusion, have combined to develop higher working efficiencies, and great credit is due to mining and manufacturing companies for the risks that they have taken over the past years in expenditures for designing and developing new machinery and new operating technique.

James Hyslop, Executive Vice President, Hanna Coal Company, and Chairman of the Safety Committee, spoke briefly of the work which his Committee has under way. He cited the report on "Coal Mine Haulage Accidents" recently published in Mining Congress Journal as revealing a situation to which the industry should give its serious attention. As pointed out in this report, coal mine haulage accidents have not been reduced proportionately to the reduction made in other phases of mining, and in spite of modern equipment and safety devices, there is still much room for improvement in our haulage accident record. Mr. Hyslop briefly outlined studies being made on the prevention of mine fires and mine explosions, saying that considerable data on both of these subjects has been compiled and the Committee hopes to present this to the industry as a means of combating the two hazards.

Committee Reports

At the morning and afternoon sessions each Committee presented an account of one or more of its studies but the procedure varied from that of preceding years in that no "progress reports" were made. Instead, copies of preliminary reports which had been prepared especially for the Conference were distributed and the data which they contained was then discussed in open meeting. Those present were specifically asked to make corrections to the data in the reports and to give their own ideas as to what other material should be included; there was a very gratifying response and many valuable suggestions were received which will be included in the published reports. These publications will appear in early issues of Mining Congress Journal, but because of the changes made at the Conference, it is not possible in this issue to give more than a general outline of what each committee covered.

Methods of Pillar Recovery

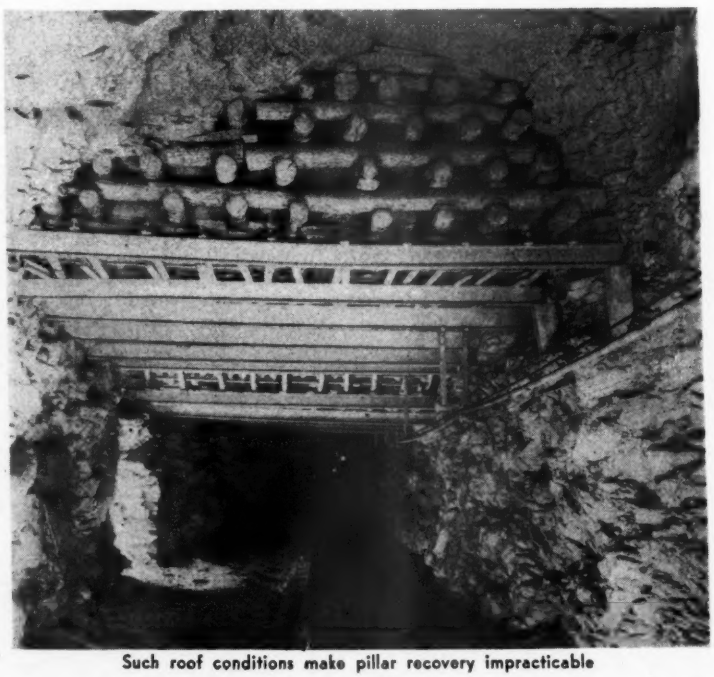
ROOM AND PILLAR MINING UNDER WEAK ROOF

By A. E. SPOTTI
Committee on Roof Action

THE March, 1947 issue of the MINING CONGRESS JOURNAL, published a report of the Roof Committee by H. P. Greenwald entitled, "What Roof Conditions Permit Pillar Recovery?" Four types of mine roofs were suggested for study and this report presents an example of mining under "Very weak roofs that require close timbering and even lagging." This condition is considered by the committee as being unfavorable and even prohibitive to pillar recovery and the alternate plan is to make as high an extraction as possible from the room work.

The mine described operates as the Pittsburgh No. 8 seam of Eastern Ohio, where the average coal height is five feet and the bottom consists of a rather soft shale. The coal is overlain with a consistent one-foot layer of drawslate. Above the drawslate is another seam of coal, varying from just a trace to five feet in thickness, but generally averaging three feet. This coal serves as the mine roof and is locally referred to as "roof coal." A soft gray shale, badly fractured and slickensided, overlies the roof coal and ranges from six to fifteen feet in thickness. This material has little or no structural strength and caves at the slightest break in the roof coal. The limestone caprock covers this shale and drillings have indicated six to thirty-five feet of the material. This limestone is massive, of great strength, and attempts to break it into controlled falls have not been successful. Overburden ranges from 100 to 400 ft.

On the basis that the roof has made it impractical to recover pillars, the mining system adopted is to drive wide rooms, with narrow pillars, so as to get maximum extraction on the first and only mining. (Mr. Spotti then described in detail their methods of mining and timbering which will be covered completely in his published report.)



Such roof conditions make pillar recovery impracticable

ROOM AND PILLAR MINING UNDER DIFFICULT ROOF CONDITIONS

By D. C. RIDENOUR
Mechanical Loading Committee

MECHANICAL mining of the Pittsburgh coal without cleaning facilities is being made possible by the use of crawler type loaders and rubber tired shuttle cars operating under slate. Two mines using the same equipment in the same seam arrived at entirely opposite conclusions as to the adaptability of this type of mining to their natural conditions. The seam

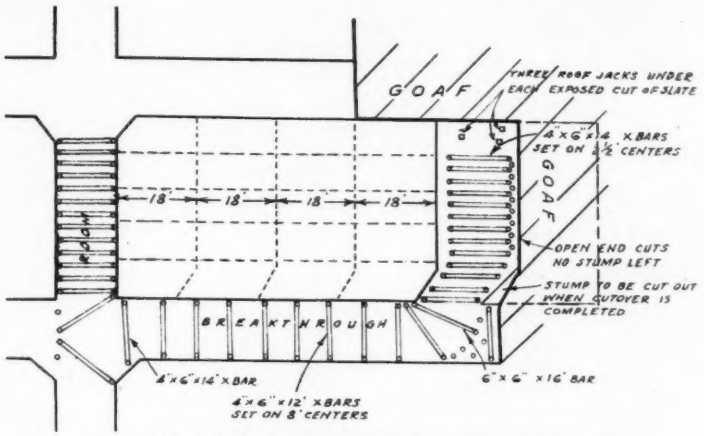


Fig. 1—Method of supporting weak roof during pillar extraction

is 5 ft. 7 in. thick, including 5½ in. of slate bands; at Mine A it is overlaid with drawslate that varies in thickness from a few inches to 6 ft. and in hardness from a fairly firm shale to a shale containing slips of soft mud. Above the slate are 4 to 5 ft. of roof coal and slate, some of which makes a good top which can only be broken if the coal is fully extracted. The bottom is a hard fireclay that makes a very satisfactory roadbed for shuttle car haulage so long as it is not permitted to get wet, but very small quantities of water will quickly soften the clay and make the roadway impassable.

This pillar recovery in this seam was abandoned as a result of excessive timbering, difficult mining conditions, low production and a dirty coal product, and the equipment moved to Mine B in the same coal seam. Slate conditions here are somewhat difficult inasmuch as the slate is hard and regular, about 12 in. in thickness, and full of slips. Roof above the slate measures are similar to those at Mine A, except that there is 320 ft. of cover as against 200 ft. at Mine A. The block system was used with rooms and breakthroughs driven 14 ft. wide and rib cutovers 18 ft. wide; the rooms are on 122 ft. centers. (See Fig. 1.) This system under adverse roof conditions has proved to be a very satisfactory method of producing clean coal and is definitely a considerable improvement over the room and pillar system. (Note: Mr. Ridenour gave further details on their system which will be included in his report.)

Discussion

The floor discussion which followed these two reports covered several phases of coal recovery with emphasis on the roof action. The cleavage in the overlying strata was discussed both pro and con as having an effect on the roof breaks and instances were cited where this effect had and had not been noticed. This phase of pillar recovery is already being studied by the roof committee but a report is not yet ready for presentation.

C. C. Conway, in describing practices in Illinois, mentioned an experiment now underway at the mines of his company, to support a weak roof by hanger rods anchored with expansion sleeves in a strong overlying strata. By eliminating posts, this method if proved successful, will make it possible to set supports in the center of an entry or wherever most needed for holding the top. It is quite a novel idea and attracted considerable discussion at the meeting. Mr. Conway stated that the method was still in the early experimental stage although results so far were decidedly encouraging and he was especially requested by the Conference to submit a progress report after the practice became more established.

Belt Conveyor Gathering Haulage

A JOINT study by the Conveyor and Haulageroads Committees on main line underground transportation was published in August, 1947, MINING CONGRESS JOURNAL, and is being continued to cover tracks and belts for gathering haulage in a panel entry. It is to be based on the specifications below and will include, 3-ft., 4-ft., and 6-ft. seams with 2 per cent and 4 per cent grades for and against the loads.

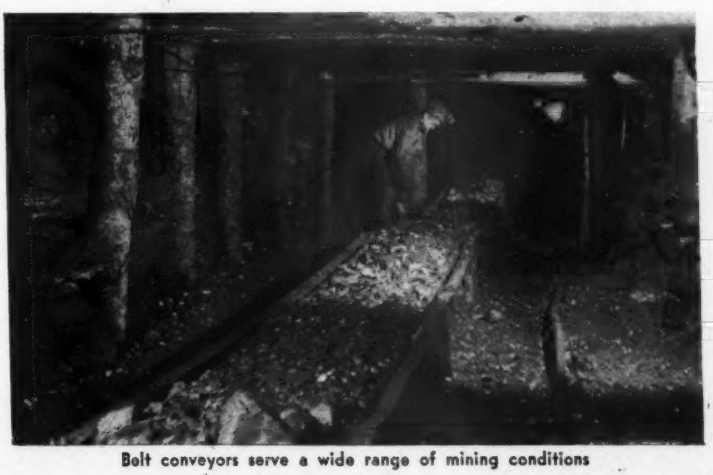
(a) A room panel is 2000 ft. long with 200 ft. barrier pillar. It is developed by three entries with rooms 300 ft. long, driven to the right and left. An 80 per cent recovery is assumed, making a production of 138,240 tons per room entry.

(b) The production is to be 1200 tons per shift, or 2400 tons per day of double shift. A year's operation is to be 250 days, making an annual production of 600,000 tons. In 10 years, this would be 6,000,000 tons.

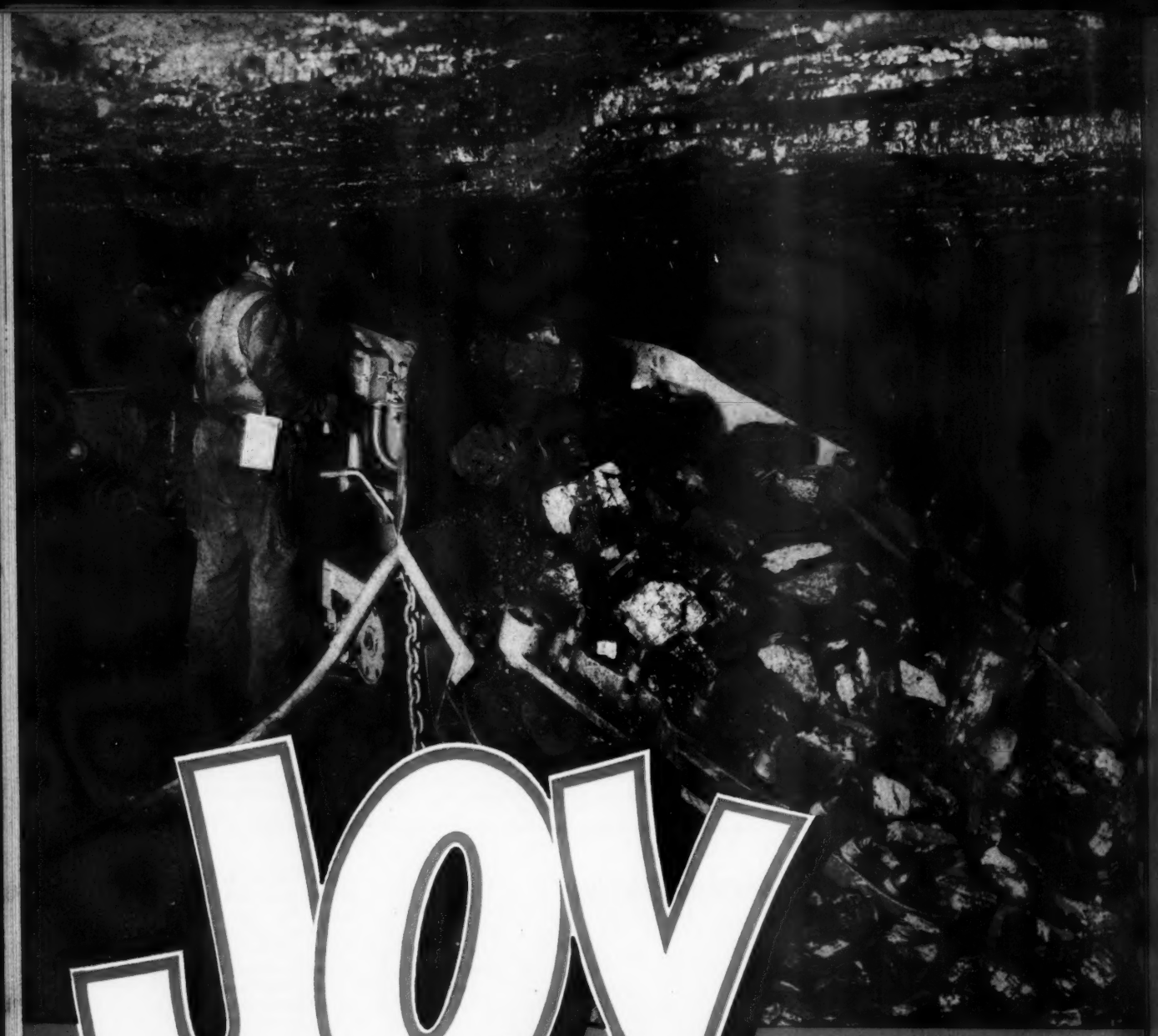
(c) For 4 ft. and 6 ft. seams, the Conveyor Committee assumes that one room panel would produce 1,000 tons per shift and a set of three entries on development would produce 200 tons. For 3 ft. coal, two room panels will be needed.

(d) Costs will be estimated for 30 in. belts, 4 ply with ⅛-in. top and 1/32-in. bottom.

(*Continued on page* 58)



Belt conveyors serve a wide range of mining conditions



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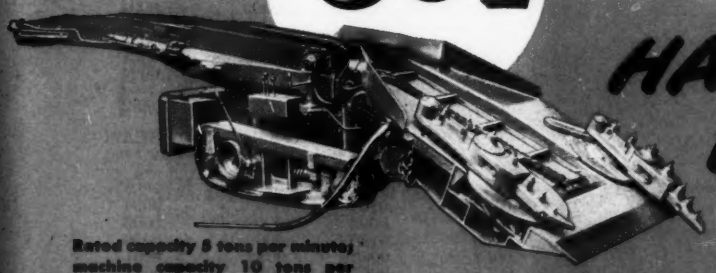
11-BU LOADER

HANDLES UP TO 10 TONS PER MINUTE IN HIGH SEAMS



Rated capacity 5 tons per minute; machine capacity 10 tons per minute. Sturdily constructed for heavy duty work in seams averaging 60" or more in thickness.

JOY

14-BU LOADER

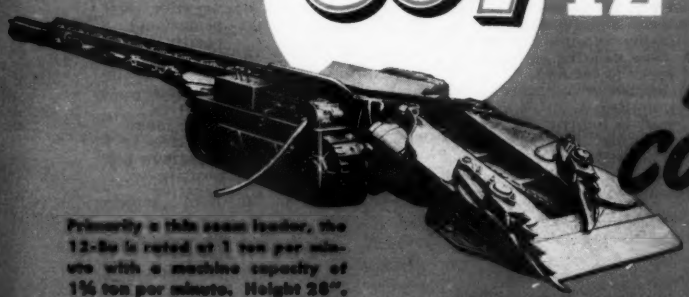
LOADS AS HIGH AS 8 TONS PER MINUTE IN LOW SEAMS

Rated capacity 8 tons per minute; machine capacity 8 tons per minute. Available in 30½", 33" or 36" heights. Individual motors drive gathering arms.

JOY

12-BU LOADER

IS IDEAL FOR CONVEYOR MINING



Primarily a thin seam loader, the 12-Bu is rated at 1 ton per minute with a machine capacity of 1¼ ton per minute. Height 28".

W&D CL 1259

JOY DIVISION

JOY MANUFACTURING CO.

GENERAL OFFICES: HENRY W. OLIVER BLDG., PITTSBURGH 22, PA.

(e) Power is 250 VDC and estimated at 2c per kwh. (Note: The Power Committee will submit plans and estimates for the conversion and line equipment.)
(f) Labor rate is to be $1.00 per man hour.

Using the above general specifications, three Conveyor Sub-Committees have prepared estimates for belt installation and operation in varying seam heights and grades. The estimates show detailed methods of calculating each item in the cost; these will be given in the reports to be published later, but in this issue only the cost summaries as approved at the Conference are submitted.

The foregoing reports brought out quite a little discussion relative to size of belts and their construction, but particularly as to the power needed for a belt operation. J. O. Cree of the Power Committee submitted a preliminary report showing the power system, size of conversion units, etc., needed for the main line haulage systems with tracks and belts, as covered by the report published in the August, 1947, MINING CONGRESS JOURNAL. Some revisions were recommended in Mr. Cree's figures with the idea that the power system must include not only the main line haulage, but must also be designed to include all operations underground clear to the working faces.

SUMMARY OF COSTS PER TON FOR BELT GATHERING IN A 4 FT. SEAM
Submitted by A. E. Long

Grades	Plus 2%	Plus 4%	Minus 2%	Minus 4%
Depreciation	.0102	.0104	.0099	.0094
Interest	.0003	.0003	.0003	.0003
Power	.0100	.0100	.0060	.0050
Supply	.0052	.0053	.0052	.0051
Labor	.0084	.0084	.0084	.0084
Total	$.0341	$.0344	$.0298	$.0282

SUMMARY OF COSTS PER TON FOR BELT GATHERING IN A 6 FT. SEAM
Submitted by Robert Fletcher

Grades	Plus 2%	Plus 4%	Minus 2%	Minus 4%
Depreciation	.0102	.0104	.0099	.0094
Interest	.0003	.0003	.0003	.0003
Power	.0100	.0100	.0060	.0050
Supply	.0052	.0053	.0052	.0051
Labor	.0057	.0057	.0057	.0057
Total	$.0314	$.0317	$.0271	$.0255

SUMMARY OF COST PER TON FOR BELT GATHERING IN A 3 FT. SEAM
Submitted by C. W. Thompson

Grade	Plus 2%	Plus 4%	Minus 2%	Minus 4%
Equipment:				
Depreciation	.0206	.0210	.0202	.0195
Interest	.0061	.0063	.0060	.0058
Supplies	.0020	.0021	.0020	.0019
Power	.0072	.0085	.0060	.0052
Labor	.0308	.0308	.0308	.0308
Total	$.0667	$.0687	$.0650	$.0632

Full Seam Mining

FACTORS AFFECTING MECHANICAL LOADING

Submitted by R. D. SNOUFFER
Mechanical Loading Committee

THE Committee on Surface Preparation has made considerable headway in their study on Full Seam Mining and their concern is naturally with the coal cleaning problem on the surface. However, to make this study complete, the Mechanical Loading Committee has been asked to consider the subject from the viewpoint of the underground operation and with this in mind, the outline submitted here has been prepared as a start in our study and to show of what our problem consists. We must first set down a list of factors which influence our decision from the qualitative viewpoint; that is to say whether the influence is possitive, negative or merely provisional. A provisional value may be beneficial within certain limits and detrimental within others. Once these factors have been recognized and agreed upon, it will then be necessary to arrange them in order of their importance and this in turn may be followed by the assignment of numerical values.

The list of factors given in Table I is not to be considered as complete and the assignment of qualitative value has been attempted only as an illustration of the foregoing thought.

That mining conditions may never be reduced to sets of formulae is hardly probable, but we may expect a great many developments which will reduce some of the uncertainties which arise in adopting a system of mining from one set of conditions to another without adequate knowledge of the accumulative effect of unlike natural conditions.

TABLE I.—LIST OF FACTORS WHICH INFLUENCE FULL SEAM EXTRACTION

If the following factor is applicable	The Effect of Full-Seam Mining is then:
More material must be handled	negative
Contaminating material disintegrates rapidly	negative
Contaminating material disintegrates slowly	provisional
Recovery of high quality adjoining seam possible	positive
Increased tonnage from existing equipment	positive
Combustability of waste is reduced	positive
Tipple capacity is limited	negative
Washer capacity is limited	negative
Surface waste disposal is limited	provisional
The haulage ways are long	negative
Large coal sizes are desired	negative
Equipment maintenance, proper face preparation	positive
Equipment maintenance, poor face preparation	negative
Material now selectively excluded is:	
1. High Ash Coal	provisional
2. Bone	negative
3. Slate	provisional
Effective selective mining can be accomplished	negative
Larger equipment could be used	positive
Would increase height of workings	provisional
Cycle can produce more coal loading time	positive
Seam conditions are irregular	negative
If immediate roof is weak	positive
If immediate roof is strong	negative
Supervision is now spread out	positive

COAL LOSSES IN WASHER REJECTS

Submitted by J. DICKERSON MARTIN
Surface Preparation Committee

THE report on this subject, as approved by the Surface Preparation Committee at their last meeting is a part of the study on full seam mining. It appears in the November MINING CONGRESS JOURNAL and at the conference this report was read and attention was called to a typographical error on page 45 which gives a figure of 0.05 per cent for the sinks. The correct figure should be 0.5 per cent. In the discussion a question was asked as to whether, in addition to reducing the fuel value in the reject, the sulphur content in the reject could also be reduced with the idea of eliminating stream pollution. D. N. Griffin answered this question by stating that sulphur separation had been done in some sections of the Midwest as a war measure for recovering the sulphur.

T. W. Guy, committee chairman, said that in his experience the importance of reducing the fuel losses in the reject had not been properly appreciated by the coal industry. Fuel losses in the reject which are negligible in selective mining become a real cost factor when full seam mining is practiced; the committee studies, therefore, will be pointed toward emphasizing ways in which coal wastes will be reduced in cleaning plants.

A bad example of coal wasted on the slate dump

Underground Power Installation

GROUNDING D. C. MINING EQUIPMENT

Submitted by D. E. RENSHAW
Committee on Underground Power

THE grounding of the frames or enclosures of stationary or permanently mounted electric machines and devices is a standard safety practice in all industries, including coal mining. Industry, in general, also follows the practice of grounding the frames of portable electric machines. In coal mining, small portable machines, such as hand-held or post-mounted electric drills, are practically always frame grounded. However, there is sharp disagreement regarding the overall or net benefits obtained by grounding the frames of larger machines, such as loaders, cutters and shuttle cars, which generally require longer and larger cables. Because of this disagreement, the Committee on Underground Power has undertaken the study of the subject of "Frame Grounding of Direct-Current Equipment Underground." This report is intended to present fairly the merits and de-merits of frame grounding and to present the recommendations of the committee.

In this study, the committee has, no doubt, been influenced by the regulations which have been established by competent authorities. The National Electrical Code and the National Electric Safety Code require the safety grounding of the frames of portable equipment, specific mention being made of equipment used in hazardous locations, such as places where combustible dust or flammable gas may be suspended or diffused in the air. The U. S. Bureau of Mines Schedule 2E covering permissible equipment requires frame grounding of stations, semi-portable and portable machines. The Federal Mine Safety Code calls for the grounding of metal conduit, metallic coverings and armor of cable, metallic frames, casing and other electric equipment, casings of transformers, and mining equipment mounted on rubber tires or caterpillar treads.

In at least five states of this country, safety grounding is required by law, and most coal mining departments of the other coal producing states either require or recommend it.

(With this introduction, various methods of grounding different types of machines were described. The complete report as presented by Mr. Renshaw was discussed at considerable length by a number of those present and after the discussion had ended, the report was approved by the conference. It is scheduled for publication in an early issue of MINING CONGRESS JOURNAL.)

Power Discussion

Following the presentation and approval of Mr. Renshaw's report, there was quite a lengthy discussion, led by Richard Maize, on a number of items relative to the use and distribution of underground power. Flame resisting cables, size of grounding wire, splicing and vulcanizing trailing cables, as well as recommended practice in their use and repair, were matters that brought forth much comment. This discussion will be referred to the Power Committee and will no doubt result in special studies being made on some of the questions which were raised. While there was some differences of opinion expressed on certain details, there was no disagreement at the conference that safety in the use of electricity must go hand in hand with the increasing use of power driven machines in our coal mines.

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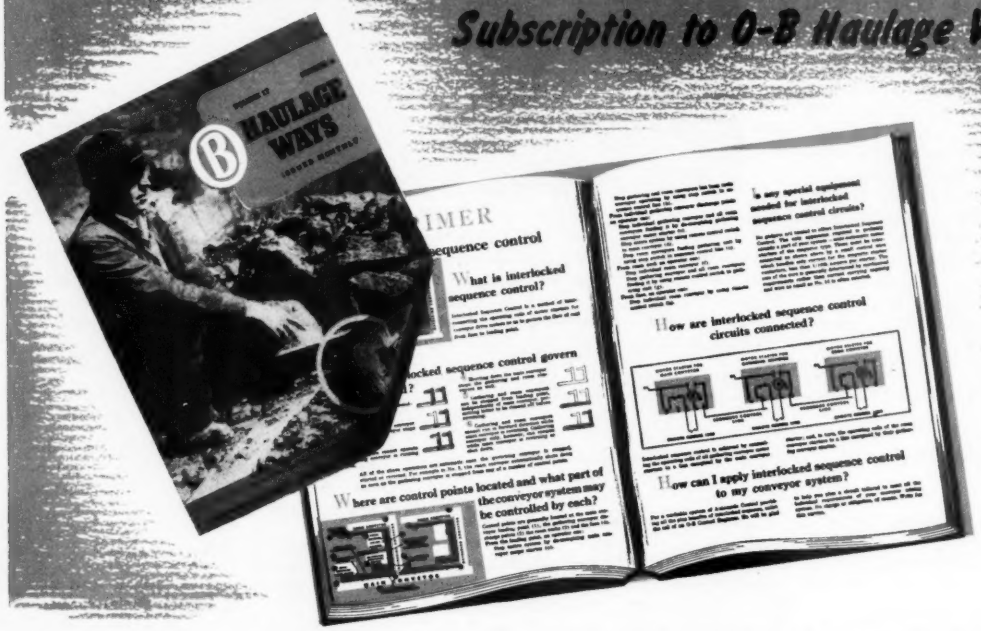

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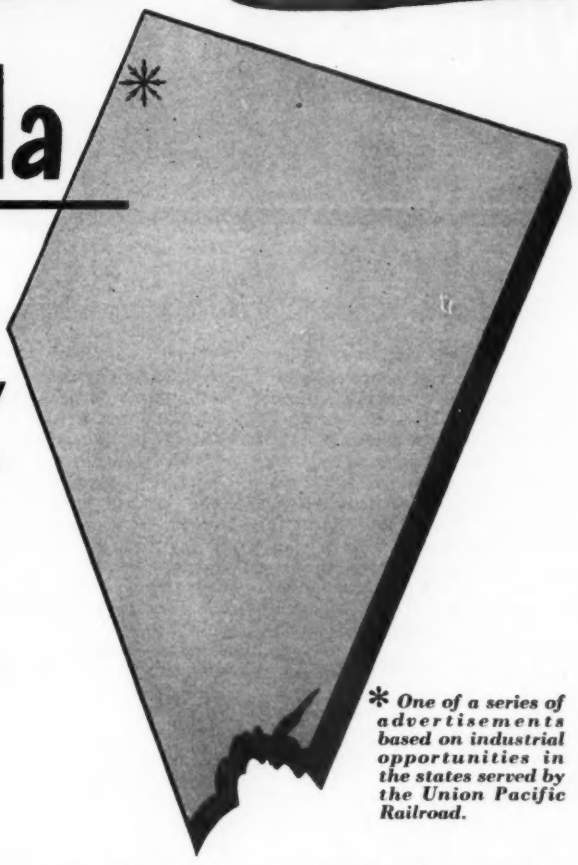
TREASURE MAP OF INDUSTRY

Nevada*



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* *One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.*

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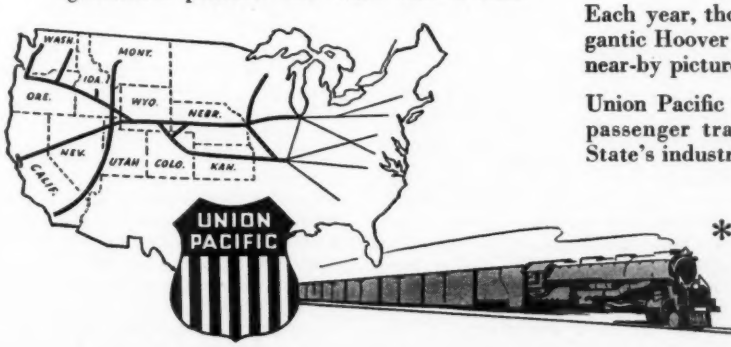


* *Address Industrial Department, Union Pacific Railroad, Omaha 2, Nebr., for information regarding industrial sites.*

UNION PACIFIC RAILROAD

THE STRATEGIC MIDDLE ROUTE

WHEELS OF GOVERNMENT

As Viewed by A. W. DICKINSON of the American Mining Congress

QUICK Senate action has followed the President's message presented to the special session of Congress which convened November 17. That part of the message calling for interim aid to France, Italy and Austria amounting to $597,000,000 is now being approved by the Senate in the Vandenberg-Connally bill, S. 1774, intended to provide food, seed, fertilizer, coal, petroleum and other needed commodities. The recipient countries would be committed to encourage a self-sustaining economy, to publicize the purpose, source and amounts of commodities made available by the United States, and to permit representatives of our Government to observe and report on the distribution of these supplies.

The President told the Congress that he will soon present his recommendations on the so-called "Marshall Plan" which contemplates a long-range European recovery program. In this connection, Commerce Secretary Harriman, Chairman of the President's Committee on Foreign Aid, has furnished a report estimating a cost of nearly $6,000,000,000 in 1948 and between $12,000,000,000 and $17,000,000,000 over a four-year period. The report stated that this country can furnish Europe with the heavy shipments of coal required, and placed emphasis on furnishing steel-producing equipment rather than steel sheets, strip and scrap.

A substantial number of both majority and minority members in the Congress is sharply criticizing the anti-inflation part of the President's message, which calls for restoration of consumer credit controls and restrictions on inflationary bank credit; regulation of speculative trading; enlarged export controls; authority to allocate transportation facilities and equipment; efficient utilization of grain in livestock feeding; inventory control of scarce commodities basically affecting living costs and industrial production; extension of rent controls; and authority to impose consumer rationing and price ceilings on products which basically affect living costs and industrial production, together with imposition of wage ceilings where necessary.

Congress may grant consumer credit control legislation, curb inflationary bank credits, regulate speculative trading on commodity exchanges, extend export and rent controls and continue authority to allocate transportation facilities and equipment, but there will continue to be definite opposition to allocation and price control on coal, steel and other commodities.

Tax

Ways and Means Committee Chairman Harold Knutson's plan to snap an individual income tax reduction bill through in the special session was short-lived. However, a definite drive to this end will be the first order of business in the regular session in January, according to Knutson's further announcement.

The special Advisory Tax Committee under former Treasury Undersecretary Roswell Magill has submitted its report, calling for clarification or correction of the many inequities and unforeseen situations which have arisen since the last revision of the revenue laws in 1942. Among the recommendations are: Reduction of individual income taxes; adoption of the community property principle; reduction of corporate income taxes; an offset tax credit to individuals for the tax paid by a corporation with respect to their dividends; revisions in estate tax law; extension of carry-forward period for net operating losses from two to seven years, with elimination of present loss carry-back provision; corporations to have full deduction for dividends received from other corporations already taxed; removal of 2 per cent penalty on consolidated returns; modification of Section 102 restrictions on retention of corporate dividends; allowing deductions for capital losses under capital gains tax; correction of certain Bureau of Internal Revenue practices on depreciation and depletion allowances; permit current deductibility of research, development and sales promotion expenditures; liberalization of definition of net operating losses in Section 122 to permit percentage depletion, exempt interest, and capital gains and losses to be treated as deductions for carry-forward purposes in the same way they are treated in the ordinary tax year; and lower tax rates for corporate incomes under $50,000.

There is still considerable question concerning the chance of getting a general revenue law revision bill through in 1948 because of the plans of Congressional leaders for an early adjournment.

Foreign Trade Agreements

Shocking to domestic producers of metals, nonmetallic minerals and many other commodities was the State Department's announcement of November 17 of tariff reductions made at Geneva, which in the main reduced rates to an equivalent of the Underwood Tariff Act of 1913. The President's proclamation specifically setting forth the action under the Geneva Foreign Trade Agreements is expected during December. January 1, 1948, is the effective date for reductions accorded to the United Kingdom, Canada, Australia, France, Belgium,

Washington Highlights

CONGRESS: Convened in Special Session November 17.

TAX: Bill cutting individual's tax due in January.

TRADE AGREEMENTS: Tariffs cut to 1913 level.

WAR MATERIALS: Duty-free importations ended.

TAFT-HARTLEY ACT: Gaining popularity.

WAGE-HOUR: Amendment possible.

SECURITY RESOURCES BOARD: White House selects members.

The Netherlands and Luxembourg, but the effective date will be later for other participating countries which will not have formally approved the Act by that time. Ultimately, under the most-favored-nation principle, the reductions will be available to all countries which do not discriminate in trade practices against the United States.

Although the general trade agreement provides that a particular tariff reduction may be withdrawn or modified if it increases imports so sharply as to cause or threaten serious injury to domestic producers, it is probable that any corrective steps undertaken by a producer would require much time and effort. Many House and Senate members have denounced the sweeping tariff reductions. Finance Committee Chairman Millikin of Colorado has stated that there may be substantial reduction in present executive power over trade agreements when further extension of the Reciprocal Trade Agreements Act (it expires June 12, 1948) is requested in the coming session of Congress. Senator Millikin forecast that Congress may well insist upon a new method of determining "peril points" below which reductions should not be made. He said the administration of such a procedure might be put under the U. S. Tariff Commission. Definite resistance to extension of the law is being voiced by members of the House Committee on Ways and Means and a strong effort is anticipated to require ratification of reciprocal trade agreements by Congress before they can become effective.

Tariff reductions on specific metals and minerals have been reported in current bulletins.

Terminate Duty-Free Admissions

The practice of importing "war material" duty-free by RFC, the Department of Agriculture, Department of Commerce, and U. S. Maritime Commission was terminated by Executive Orders issued November 12. This authority had been granted early in 1942. The authority of the Treasury Department to make duty-free importations still continues under the activities of the Strategic and Critical Materials Division in the Bureau of Federal Supply. Division officials have stated that in comparing prices of domestic and foreign offerings of strategic and critical materials the duty rates which apply to the foreign materials are added. If foreign materials are then purchased, they are imported duty free, but in the event of a later sale under the provisions of the Stockpiling Act of 1946 the duties as of the time of importation are to be added.

Taft-Hartley Act Administration

In the five months that have passed since the Taft-Hartley Labor Management Relations Act was enacted, the general acceptance and approval of this law have become increasingly widespread. More and more of the recalcitrant union officials are falling into line on the requirements of filing non-Communist affidavits and financial statements. The newly constituted National Labor Relations Board is apparently endeavoring to administer the law in an impartial manner. In a recent ruling the Board has held that the CIO National Maritime Union and the Wholesale and Warehouse Workers Union shall not be given a place on the ballot in collective bargaining elections because neither union is in compliance with the affidavit requirements of the Taft-Hartley Act. Also on November 14 the Board revoked a number of collective bargaining election orders, previously issued, because of union officers' refusal to furnish the non-Communist affidavits. This ruling hit an election requested by the CIO International Union of Mine, Mill and Smelter Workers, at Ray, Ariz.

One interesting exception has appeared in an issue which arose when employes of a drydock operator voted in a Board-conducted election to select two members of their union as their bargaining representatives. The Board ruled that individuals can be certified as bargaining agents without having to file non-Communist affidavits, holding that the men elected were "bargaining agents" and not "officers" of a union.

Wage-Hour

The hearings conducted by the House Labor Subcommittee under Chairman McConnell of Pennsylvania on amendment of the Fair Labor Standards Act of 1938 have continued beyond the planned closing date of November 21. The Subcommittee concluded four days' close questioning of Wage and Hour Division Administrator McComb on November 25, and recessed until December 12 to hear concluding testimony by Solicitor Tyson of the Department of Labor.

While the Administrator, supported

(*Continued on page* 100)

"What's Brother Lewis doin' nowadays?"

El Paso Convention An Outstanding Success

Secretary Julian D. Conover opened the meeting. He reviewed the progress made in the past year in solving some of the industry's problems and urged the need of maintaining a strong domestic mining industry as the backbone of our industrial and military strength

ON October 27-29, for the first time in seventeen years, the Western Division of the American Mining Congress met for its annual Metal Mining Convention at El Paso, Tex. Held jointly with El Paso's famed International Mining Days Celebration, the meeting had a distinctly international tinge. The participation on the program of high officials from Mexico, as well as important governmental authorities from Washington, served to make this gathering of unusual interest to the mining industry.

Even the gods of the weather smiled upon the visiting mining men. Throughout the convention the days were pleasantly warm and sunny and the evenings delightfully cool. The city outdid itself to make all feel at home and the El Paso Chamber of Commerce accomplished miracles in housing convention visitors. The charm and refreshing friendliness of the Southwest, so generously extended will linger in the memory of all who were privileged to attend.

The Program Committee, under the able chairmanship of Donald H. McLaughlin, president, Homestake Mining Company, was unusually successful in choice of speakers and subject matter. The outstanding nature of the program is well illustrated by a few of the topics which were covered, including: the future of the mining industry; a discussion of the postwar minerals program of the U. S. Government, and possible changes in our mining laws to encourage the search for hidden ore deposits; gold and silver and their contribution to mining; significant features of the Taft-Hartley Act in relation to the mining industry; the problems of manpower and mechanization—their relationship to greater productivity and lower cost; and the problems of the small mine operator. Two operating sessions, one devoted to recent developments in milling practice and the second to mining progress, were unusually well attended largely due to the originality of the papers presented.

★

By JULIAN W. FEISS

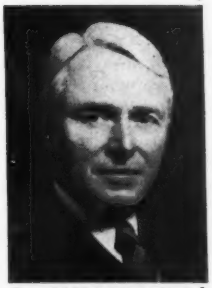
★

Harry M. Lavender

Harry M. Lavender, Vice President and General Manager, Phelps Dodge Corp., and Chairman, Western Division, American Mining Congress, said the meeting was "the realization of a dream" for many of the Southwest operators who have long looked forward to a Western Division meeting in that region.

■

Donald H. McLaughlin, President, Homestake Mining Co. and Chairman of the Program Committee, thanked the Mayor for the splendid arrangements as to the weather, adding that even the Californians present were envious of the bright sunshine.



Donald H. McLaughlin

State Secretaries Meet

On Sunday afternoon prior to the opening of the convention, secretaries of the Western Metal Mining Associations met at the Paso Del Norte Hotel to discuss problems of mutual interest to mining. With Charles F. Willis, State Secretary, Arizona Small Mine Operators Association presiding, the various secretaries thoroughly aired, in an informal manner, questions of aid to marginal mines, loans, SEC regulations, means for providing incentive to new mining enterprise, and kindred subjects. This meeting, which lasted well into the afternoon, was outstanding. The secretaries of our western associations are unusually close to all segments of mining, and being in a position to view impartially the problems of small and large mine operations, their conclusions are constructive and well reasoned.

Opening of Convention

"A Story of Texas and its Natural Resources," a splendid film furnished through the courtesy of the U. S. Bureau of Mines, opened the first session of the convention at the Scottish Rite Cathedral on Monday morning. Other sessions of the convention were preceded by 20 minute films dealing with the mining and processing of some important metal or non-metal—a feature which did much to enhance

The Welcoming Luncheon featured addresses by Senor Lec. Eduardo Bustamante, Mexico's Undersecretary of Finance, and Julius A. Krug, U. S. Secretary of the Interior

the attractiveness of the El Paso program.

Following the picture, the meeting was formally opened by Julian D. Conover, Secretary of The American Mining Congress. Recalling the work done by Brent Rickard and Senor Gustavo Serrano, who were both present in connection with the last El Paso meeting in 1930, he thanked the El Paso committees under the chairmanship of Ed Tittmann and the secretaryship of Jack Shores for their hard work and skillful handling of the many problems involved in this much larger gathering. Mr. Conover then went on to outline the progress made since the Denver meeting a year ago in solving some of the problems which had been before the industry at that time. He pointed out that Congress had knocked out the portal-to-portal suits, which had threatened the whole industry with terrific liabilities; that a new labor law had been enacted which tends to equalize responsibilities under the Wagner Act, to check abuses by the union leaders and to restore real collective bargaining; and that work had started on a much needed revision of the tax laws but that attempts by Congress to reduce taxes and thus stimulate the flow of investment capital had thus far been blocked by a Presidential veto. He also noted the granting of percentage depletion on a permanent basis to various non-metallic minerals; the removal of certain SEC restrictions on the sale of primary mining securities; the lifting of arbitrary controls which had kept metal prices below the world market; and the placing of responsibility for mineral policies of the Interior Department under the heads of the Bureau of Mines and Geological Survey —men of proved ability who have a sympathetic understanding of mining's problems—and other improvements in mining's general position and outlook for the future.

Pointing out that one of the major lessons that the war should have taught was the need of maintaining a strong domestic mining industry as the backbone of our industrial and military strength, Mr. Conover concluded, "In today's troubled world, with Communism openly on the march, and real peace nowhere in sight it is more than ever imperative that we build up our mining industry on a sound basis; that we create an atmosphere in which venture capital is justified in assuming the hazards of mineral discovery and development; that we restore the incentive of possible profits, *after taxes*, sufficient to compensate for the risks taken; that we adopt policies on tariffs and low-cost competition from abroad, on public land development, on stockpiling, on mine financing, on topographic and geologic mapping, on the encouragement of prospecting and research, on fiscal and monetary matters, on labor relations and manpower problems, on Government competition and Government regulation of industry, which will permit mining enterprise to replenish depleted ore reserves, discover hidden ore-bodies, develop small mines into large ones, perfect new treatment processes, and maintain the mineral production so essential to our future security."

Worthen Bradley, president, Bradley Mining Company, was then introduced as chairman of the opening session. He called first on Dr. James Boyd, director of the U. S. Bureau of Mines, who spoke on the postwar mineral programs of the United States Government, reviewing many of the Bureau's activities and its projected future policies in respect to the mining industry. The complete text of Director Boyd's talk was published in the November issue of MINING CONGRESS JOURNAL.

A. M. C. President Howard I. Young presided at the Labor Session, which considered the significant features of the Taft-Hartley Act in relation to mining. Shown with Mr. Young are (left to right): Charles R. Kuzell, Rep. Fred A. Hartley, Jr., and Frank J. Ryley

H. R. Joesting, chief, Geophysics Section of the U. S. Geological Survey, then spoke on "The Future of Geophysical Prospecting." Robert M. Searls of San Francisco discussed "Possible Changes in the Mining Law to Encourage the Search for Hidden Ore Deposits" and the final speaker of the session, Otto Herres, vice president of Combined Metals Reduction Co., spoke on "Fostering a Strong Domestic Mining Industry." As might be anticipated, a period of most interesting discussions followed these papers. Those who participated were Reno H. Sales, Ira B. Joralemon, William Evans, and Burt B. Brewster. The addresses of these and other speakers at the different convention sessions will be found in abstract form beginning on page 74.

Successful Welcoming Luncheon

Monday noon, delegates attended a welcoming luncheon which was given on the lower floor of the same building. Howard I. Young, president, The American Mining Congress, presided and introduced as the first speaker, Mayor Dan Ponder of El Paso. After welcoming the visitors to El Paso the mayor recalled some of the past conventions which the American Mining Congress had held in the city. He stated that the first meeting was in 1903, the second in 1930 and that this, the third, was the largest of all. He told the story of a drilling contest which was held as part of the festivities in 1903 prior to the days of pneumatic tools. Holes were drilled in a big block of granite which had been set on a pedestal in Memorial Park. Mayor Ponder said that the granite block is still in place with the holes which were drilled by single and double jacking. He then presented Mr. Young with the key to the city, stating that it was symbolic of the best wishes of the 140,000 people of El Paso.

After thanking Mayor Ponder for the key, Mr. Young read a welcoming telegram from the Governor of Texas. He then presented Harry M. Lavender, vice president and general manager of the Phelps Dodge Corporation and chairman of the Western Division of the American Mining Congress. Mr.

Lavender spoke briefly, saying that the meeting was the realization of a dream for many of the operators in the Southwest, as they had looked forward to the day when it would be possible to hold one of the Western Division meetings in that region. Donald McLaughlin, Chairman of the Program Committee was the next speaker. He thanked the mayor for the splendid arrangements as to the weather, and added that even the Californians present were envious of the bright sunshine. After reviewing in brief the work of the Program Committee, he introduced the state chairmen, seated at the speakers' table, who had done so much to formulate a worth-while program.

Thomas McNally, president, McNally-Pittsburg Manufacturing Corporation, and chairman of the A.M.C. Manufacturers Division, who was next called upon, spoke briefly of the interdependence of the manufacturer and the miner. He was followed by E. McL. Tittmann, Chairman of the International Mining Days Celebration, who in turn welcomed the visitors on behalf of his organization and introduced the chairmen of the various local committees who had ably handled the convention arrangements. Those responding, Mrs. J. E. Despins, Robert J. Benson, C. C. Cragin, William Knowles, E. M. Thomas, R. S. Beard and J. J. Shores were warmly applauded by all present for their splendid work which meant so much to the success of the meeting.

Mr. Young then introduced the first guest speaker, Senor Eduardo Bustamante, Undersecretary of Finance of the Republic of Mexico. Reviewing in brief the history of mining in Mexico, Sr. Bustamante discussed the importance of the minerals industry to the economy of his country. Pointing out that it was traditional in Mexico that subsurface minerals are part of the property of the nation, Sr. Bustamante said that this theory has been the cause of much misunderstanding in the past in relation to mining development. The government of Mexico, he said, has always had the right to derive from mining, not only revenues proportionate to those derived from taxes from other industries, but also additional returns representing the owner's share in the value of the mines and their content. He stated that, although Mexico cannot change its position as regards ownership of the sub-soil of the country, his government will gladly collaborate with any industry wishing to aid in the establishment of new mines and plants within Mexico. Pointing out that the United States has the capital and the technical knowledge while much of the rest of America has the resources and labor, he expressed the hope that American mining interests would consider new investments in Mexico. Senor Bustamante delivered this address in Spanish and closed with a few words in English; copies of his full address in English, were made available to convention visitors. His talk was received with great interest by those present, many of whom had mined for years in Mexico.

Mr. Young then introduced the next speaker on the program, Secretary of the Interior Julius Krug.

Secretary Krug had flown to El Paso with Director James Boyd the preceding evening on a B-29—the world famous "Pacusin Dreamboat"—from Washington. The flight had not been devoid of interest as the plane had iced-up at an elevation of 30,000 feet and there had been engine trouble. However, none of this affected the good spirits of the Secretary who, in a speech entitled "Minerals—the Watchdog of the American Economy," reviewed the importance of the mineral industry to our national defense. Since his talk was carried in full in the November issue of MINING CONGRESS JOURNAL, the text will not be reviewed here. He also conveyed the good wishes of the United States Government to the visting officials from Mexico and to the country which they represented.

Sessions Cover Many of Mining's Problems

The second general session, with Donald H. McLaughlin as chairman, took place that afternoon. The first speaker was Sr. Ing. Gustavo P. Serrano, president of the Chamber of Mines of Mexico, who gave a very thorough discussion of the mining situation in Mexico. He was followed by Sr. Senador Antonio J. Bermudez, Director General Petroleos Mexicanos, who reviewed Mexico's current position in petroleum. Arthur Notman, consulting engineer, New York City, then discussed the future of gold and Tom Lyon, assistant to the manager, International Smelting & Refining Co., spoke on silver's contribution to Western mining.

The events of the first day were brought to a fitting climax by a "Sourdough Supper" at the El Paso Country Club. After cocktails, a splendid Mexican dinner was served and many who were on their first visit to the Southwest had an opportunity to sample tacos, tortillas, and enchiladas —food for which Mexico is famous. A floor show, followed by dancing, brought the evening to a pleasant conclusion.

On Tuesday morning there were two sessions, one devoted primarily to labor legislation and labor relations and the other dealing with the latest developments in milling. Howard I. Young, president of the Mining Congress, presided at the labor session and introduced Charles R. Kuzell, assistant general manager of the Phelps Dodge Corporation, Douglas, Ariz. Frank J. Ryley, attorney-at-law, Phoenix, Ariz., collaborated with Mr. Kuzell in presenting a discussion on the significant features of the Taft-Hartley Act in relation to the mining industry. This subject has been considered of such unusual importance that the paper will be printed in two parts in this and the next issues of Mining Congress Journal. The next speaker was the Honorable Fred A. Hartley, Chairman, Committee on Education and Labor, U. S. House of Representatives. His topic embraced further changes needed to improve our present labor law. An abstract of Representative Hartley's talk is given on page 78. Discussion followed,

A "Sourdough Supper" at the El Paso Country Club gave first-time visitors to the Southwest an opportunity to sample many of Mexico's famous dishes

participated in by Kenneth C. Kellar, attorney, Lead, S. Dak.; E. H. Snyder, president, Combined Metals Reduction Company; Roy H. Glover, Western General Counsel, Anaconda Copper Mining Company; and F. O. Davis, treasurer, Potash Company of America.

Max W. Bowen, vice president, Golden Cycle Corporation, presided over the first operating session dealing with milling problems. The first speaker was G. B. Walker of American Cyanamid Company, who discussed the present status and potentialities of the heavy-media process. He was followed by George H. Roseveare, metallurgist, Arizona Bureau of Mines, who reviewed progress and new developments in milling practice. Royce Hardy, consulting engineer, Getchell Mine, Inc., completed the program with a brief paper on the carbon cyanide treatment of gold ores —bringing up to date the researches of this past year at the Getchell Mine which were discussed at the 1946 meeting in Denver by his father, Roy A. Hardy.

Manpower and Mechanization Reviewed

The fourth general session, under the chairmanship of E. S. McGlone, vice president, Anaconda Copper Mining Company, took place Tuesday afternoon and dealt with the problems of manpower and mechanization. First speaker was Harry Tibbs who appeared on behalf of H. C. Livingston, vice president, Union Pacific Coal Company, to describe the recruiting programs of that company. Lester F. Bishop, production foreman, Anaconda Copper Mining Company, then discussed training and safety programs that are part of the routine procedure at Butte. Dr. L. E. Young, mining engineer, Pittsburgh, Pa., followed with a discussion of mechanization for greater productivity and lower cost in metal mining. R. W. Jenkins, Sullivan Division, Joy Manufacturing Company, was the last speaker. His paper supplemented Dr. Young's in that he emphasized means of improving mining methods to keep pace with increased mechanization.

The final sessions of the meeting took place on Wednesday morning. The fifth general session was opened by Chairman Ross D. Leisk, general manager, Sunshine Mining Company. He introduced Charles F. Willis, who presented an unusually comprehensive paper on the problems of the small mine operator. Horace M. Albright, president, United States Potash Company, next spoke on the domestic potash mining industry. The concluding speaker was Henry B. Fernald, chairman AMC Tax Committee, who reviewed mining's postwar problems in Federal taxation. The meeting closed with Donald Callahan, Chairman of the Resolutions Committee and vice president of the American Mining Congress, presenting a declaration of policy, which was unanimously adopted by the convention. The Resolutions Committee had been working upon this declaration of policy almost from the time that the meeting opened and the full text is carried starting on page 70.

The second and final operating session, under the chairmanship of Horace Moses, general manager, Chino Mines Division, Kennecott Copper Corporation, was devoted to mining progress. The first speaker was R. W. Adamson, Jack Bit Division, Ingersoll-Rand Co., whose topic was the application of hard materials to rock cutting bits. Philip M. McKenna, president, Kennametal Inc., discussed Mr. Adamson's paper, and Verne Johnston, mining engineer, Oglebay Norton & Co., then reviewed briefly recent progress in fusion drilling. The final speaker was Walter C. Lawson, general superintendent, Morenci Branch, Phelps Dodge Corporation, who discussed engineering and development problems at the Morenci open pit. R. J. Mechin, manager, Edwards Division, St. Joseph Lead Company, at Balmat, N. Y., discussed Mr. Adamson's paper and Paul Sirkegian, general superintendent, Consolidated Coppermines Corporation, Kimberly, Nev., compared their operation with that of Morenci and pointed out many similarities in methods.

The "wit and wisdom" of Major General "Terrible" Terry Allen and Mayor James D. Arrington delighted the capacity audience at the Annual Banquet

Next Meeting to be at San Francisco

Following the last of the scheduled sessions, the Board of Governors of the Western Division met at the Paso del Norte Hotel for the annual luncheon meeting. Nominations to the

Board of Governors, as proposed by the various state mining associations, were duly seconded and accepted. Plans for the 1948 combined Metal Mining Convention and Exposition were then discussed and Worthen Bradley extended an invitation from the California Chapter of the Mining Congress to hold the meeting in San Francisco. This invitation was unanimously accepted and the dates for the meeting were set for September 20-23.

Wednesday afternoon had been reserved for meetings on special problems of interest to the mining industry. Those interested in Federal taxation attended a conference at the Paso del Norte Hotel under the chairmanship of Henry B. Fernald, Chairman of the Mining Congress' Tax Committee. At the Hotel Cortez, under the chairmanship of S. H. Williston, vice president, Cordero Mining Company, there was another well-attended conference on the strategic metals situation.

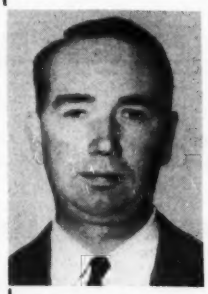
Ladies' Entertainment

A Ladies' Entertainment Committee, under the chairmanship of Mrs. J. E. Despins, provided various functions throughout the period of the meeting for the visiting ladies. On Tuesday there was a luncheon and fashion show at the El Paso Country Club. On Wednesday a special coffee was held at the Casino in Juarez. Mexican food was served and members of the women's division of the Chambers of Commerce of both Juarez and El Paso acted as hostesses. The Casino was decorated with special blue cellophane streamers for the occasion and many of the visitors who had never previously visited Mexico used this opportunity to secure some curios and purchased many of the fine handicraft products available at the attractive Juarez shops.

Annual Banquet Ends Festivities

The annual banquet, which was held at the Scottish Rite Cathedral on Wednesday evening, was the final event of the convention. Harrison M. Lavender, general manager, Phelps Dodge Corporation and Chairman of the AMC Western Division, acted as toastmaster. After introducing those at the speaker's table, Mr. Lavender presented the first speaker of the evening, Major General "Terrible" Terry Allen, USA, Rtd. General Allen has had a distinguished career in the United States Army and has become known as "the general who never lost a battle in two wars."

General Allen proved that he is not only a first-class soldier but that he also knows something of mining. He mining has always been recognized as of vital importance to national defense by our military authorities. Pointing out that the winning of the war required the assistance and cooperation of every friendly nation in the maximum use of their mineral, industrial and military resources, General Allen further stated that "the supply and replacement of combat equipment depended upon the prompt delivery of adequate supplies of essential ores and metals." He stressed the need for stockpiles of essential materials including those that must be imported and domestic materials whose supply might be cut off by an atomic bomb attack. He emphasized the need for establishing a system of universal military service, and concluded with the statement that the American Mining Congress should back up our country in the winning of the peace, with the same wholehearted support that was given to the winning of the war. General Allen's speech was received with enthusiasm and the audi- opened his address by stating that ence appreciated his wisdom and salty wit.



E. McL. TITTMANN
Manager, Southwestern Dept., American Smelting & Refining Co.
Chairman, International Mining Days Celebration.

J. J. SHORES
Secretary, Mining Committee, El Paso Chamber of Commerce.

The El Paso Committees did a wonderful job

The final speaker was the Honorable James D. Arrington, Mayor of Collins, Miss. His topic was "Defrosting America's Frozen Assets." In a spritely address, which kept his audience in a gale of laughter, Mr. Arrington pointed out that our chief difficulty today was lack of appreciation of our American heritage. Stating that the founders of this country were men of strong character who believed in truth and virtue, he said that the crying need in America today is for more men of similar character. He pointed out that we are hurting ourselves through worry—that this is a great contributing cause of unrest throughout our country today. The many amusing anecdotes with which Mr. Arrington spotted his talk, and the manner in which he presented his topic, served as a fitting climax to the El Paso meeting.

Abstracts of convention papers are given in this issue, beginning on page 74.

Over 1,500 mining men and ladies were in attendance

A Declaration of Policy

THE WESTERN DIVISION, AMERICAN MINING CONGRESS

Assembled in Annual Meeting, El Paso, Texas, October 29, 1947, declares its views upon the following matters of public policy:

THE tense international situation that now confronts the world imposes a new and grave challenge to the mining industry. This industry must provide the minerals and metals, required in ever increasing quantities, that are essential not only for national defense and domestic needs, but also for the support of a stable economy among the nations friendly to us. To accomplish this objective, it is vital that harmonious relationships be preserved between management, labor and Government, and that every obstacle be removed that might hamper the efficient operation of our mines and plants under our well tested system of free enterprise.

This accentuated demand comes upon us at a time when we have not fully recovered from the dislocation of our normal operations caused by the intensive war effort. We are still suffering from a lack of sufficient manpower. We are still faced with a scarcity of materials and supplies, and few, if any, of our mining enterprises have been able to carry on even the routine development and exploration necessary to maintain adequate reserves.

It is imperative that there be a better understanding on the part of the people generally, and of those who enact and administer our laws particularly, that the economy of our nation, the happiness and welfare of our people, the safety of the Republic itself depend upon a healthy mineral industry. To assure this there must be formulated a national mineral policy—which is long overdue —and we pledge our hearty cooperation to attain this end.

We urge upon those engaged in this industry, both management and labor, that they realize the dignity of the enterprise in which they serve and its importance to the welfare of the people of the world.

LABOR RELATIONS

Congress, by the enactment of the Labor Management Relations Act, 1947, established a labor code for the benefit of all parties: employees, employers, unions and the public. Congress acted in the public interest and should be commended by all for such constructive legislation.

Certain practices of some labor leaders still interfere with civil liberties and with the free flow of commerce, to the detriment of employees, employers, unions and the public. We believe that the Joint Committee on Labor Management Relations, created by the Act, should recommend, as part of the report to Congress required by that Act, legislation to:—

1. Illegalize a strike which is called without the prior authorization of a majority of all of the employees in the affected bargaining unit, voted by secret ballot at the conclusion of bargaining and conciliation;

2. Require that collective bargaining be done on a plant or bargaining unit basis, and prohibit the concerted industry-wide strike by a combination of locals or by an International Union;

3. Make the prohibitions of the Anti-Trust laws again applicable to unions restraining the free flow of commerce by illegal strikes, mass picketing, violence and intimidation;

4. Provide for Federal injunctions upon application by private persons to stop mass picketing and similar terroristic devices;

5. Prohibit compulsory union membership in any form as a condition of employment;

6. Exclude, as improper subjects of collective bargaining, union proposals encroaching on the employer's right to manage his business;

7. Enlarge Section 8 (b) 6 of the Labor Management Relations Act, 1947, to bar all types of "featherbedding" practices in industry.

8. Complete the program of purging the labor-management relationship from Communistic influences by providing that the National Labor Relations Board shall immediately take away the right of representation

from any local or international union if an officer thereof is a Communist, and that the Board shall not in the future certify such union until it can prove that it has cleared its house of such influence;

9. Forbid a strike to compel an employer to recognize and bargain with a union which has not complied with Section 9 of the National Labor Relations Act and used the processes of the Board;

10. Make fully effective the principle that findings of the Board shall rest upon preponderance of evidence.

A House Labor Subcommittee has begun investigation of the Fair Labor Standards Act. We recommend the elimination of those features which gravely hamper production.

We also recommend that the Act be amended to define terms such as: "regular rate of pay," "executives, administrative and professional employees," "goods," "necessary to production," and "engaged in Interstate Commerce or in the production of goods for Interstate Commerce."

TARIFFS—STOCKPILES

To maintain a vigorous and healthy mining industry, we favor adequate tariff protection for the domestic mining industry against richer foreign deposits, lower labor rates, and competition from products stimulated artificially by manipulation of foreign exchange rates or the operations of foreign cartels.

We pledge our cooperation to the Munitions Board in its administration of the stockpiling legislation. We advocate the accumulation of adequate stockpiles of metals and minerals, through close cooperation with industry as authorized by Congress.

The production of minerals is pre-eminent in insuring our national safety and well-being. Present conditions warrant an incentive program designed to foster exploration for and development of reserves, and to provide incentives to the marginal segment of the mining industry for such period as may be necessary, pending a return to normal conditions.

PUBLIC LAND POLICY

For nearly a century minerals and metals have been produced by private enterprise in the United States under a system of laws that encouraged prospecting of the public domain, assured protection of established claims while under exploration and development, and rewarded the discoverer of valuable deposits by a grant of title by patent to holding of prescribed size. We favor the maintenance of the long established policies embodied in these mining laws, and to that end we oppose:

1. All attempts to nationalize existing mines or to authorize Government engagement in any new mining enterprise.

2. All efforts to substitute a general leasing system, with the inevitable discouragement of prospecting and eventual stifling of production.

3. The present policy of the Bureau of Land Management of protesting and delaying the granting of patents, which is apparently based on the objective of holding as much mineral land as possible in public ownership until a general leasing system can be established.

We likewise oppose expansion of the present leasing system by executive order, administrative interpretation or revision of regulations under which (a) Government seizure of compelled sale for Federal use or distribution of all or part of the production from leased lands over and above royalties in kind would be authorized; or (b) exploration by private enterprise for minerals subject to the leasing system would be prohibited or restricted.

We oppose legislation designed to grant new powers over mineral lands not valuable for fissionable materials, such as authority to declare such lands national trusts under which renewal of existing leases could be denied and location of lode and placer claims prohibited.

We favor the restoration to public domain status of all lands which have heretofore been reserved for military purposes where they are no longer required for national defense, thus making them available for exploration for minerals.

We earnestly urge an immediate review by Congress of all laws under which numerous, extensive, and unwarranted reservations have been established in the United States and Alaska by executive order during the last ten years, to the end that the potentially valuable mineralized areas embraced in these reservations may be restored to the public domain.

The vast territory of Alaska is of great importance to the nation for its minerals, fish and timber. We are deeply concerned over the present policy of the Interior Department of creating huge reservations there for small groups of Indians; reservations which make prospecting and mineral exploration prohibitive. We are persuaded that these vast reservations, instead of benefitting the Indians and Eskimos, are actually detrimental to them. We urge that such reservations already created by executive order be abolished, and that those under contemplation be not established.

We deplore as inefficient and wasteful the delegation of powers to adjudicate mineral claims to new regional offices of the Bureau of Land Management, since final action in Washington is inevitable in most cases. Regional adjudication imposes one more obstacle to prompt action on mineral cases. Increase of the Washington staff of the Bureau, with adequate compensation for personnel, in our belief is the real answer to the problem of settling the vast accumulation of pending mineral applications, claims, and appeals.

We oppose the use by the Bureau of Land Management of the device of classification procedure and other obstructive methods to impair the validity of metal mining locations on the unreserved public domain before application for patent is made.

Federal recording of location notices and proofs of annual labor should not be required.

Careful consideration should be given as to the necessity for amendments to the existing mining location laws to encourage and protect prospectors using geological and geophysical techniques in the search for hidden ore bodies. This problem should have the attention of the Mineral Industries Advisory Council of the Department of the Interior as soon as that Council is appointed.

We advocate legislation affirming and declaring the ownership by the coastal States of submerged lands and their mineral resources beneath the marginal seas, in order that the States' traditionally recognized rights to these minerals may be finally established and permanently respected. On the other hand we oppose as detrimental to the national interest all pending proposals before the Congress to cede the entire public domain to the respective States in which it is located.

BUREAU OF MINES AND GEOLOGICAL SURVEY

The United States Geological Survey and the Bureau of Mines perform technical services of vital importance and great value to the Nation and to the mining industry. They are now headed by exceptionally able engineers of highest integrity in whom we have great confidence.

Appropriations for personnel and for the performance of the duties of these agencies as prescribed by Congress are relatively small items in the total cost of Federal Government, and should be made available in adequate amounts to continue all their essential activities.

The Bureau of Mines should not be made the instrument for further Federal encroachment on the rights of the States by delegating to it police powers covering the operation of mines.

MINE FINANCING

Until the Federal tax structure is changed so as to again make available venture capital for the prospecting and development of mining properties, and until certain national and state restrictions against the sale of primary securities to the public are modified or eliminated, we believe:

(1) That the RFC should continue to grant loans for the purpose of financing mining development and mining production facilities.

(2) That former section 14 of the RFC Law should be restored by Congress. This section, authorizing RFC to make mine development loans, was eliminated when the life of RFC was extended by Congress beyond June 30, 1947.

WATER POLLUTION

Water pollution is a local problem, varying widely in nature and extent, and best dealt with by State and local agencies, supplemented where necessary by interstate compacts. We oppose legislation vesting control over water pollution in a Federal agency with power to set rigid standards and to force compliance through action in the Federal courts.

VALLEY AUTHORITIES

We favor the orderly development of our waterways under the direction of the Army Engineers and the Bureau of Reclamation.

We oppose the so-called Valley Authorities program, which would divide our Nation into several separate regions, each under the control and dictation of a new set of appointed officers. We believe the basic principles of such authorities lead to the destruction of individual and State rights, and that the development of our waterways and the reclamation of our arid lands can best be carried out through existing Federal, State and local agencies working with private industry and private enterprise. We particularly object to the assumption by such Authorities of control over all natural resources and the operation and control of industries related thereto.

RESOILING DREDGED LANDS

We view with disapproval legislative measures of the type recently enacted in local communities of California in an attempt to compel resoiling of dredged land, as being physically impracticable and ineffective in restoring agricultural fertility, as economically unsound and in most cases confiscatory of the dredge operator's profits, and as constituting an undesirable legislative precedent in every respect.

GOLD MINING

The extreme difficulties of the gold miners, caught between an arbitrarily fixed domestic price and rising costs, are again emphasized, and we urge that the operators of gold mines be given the right through export licenses or other means to take advantage of the world-wide enhanced position of gold in relation to paper currencies and credit.

We again recommend the enactment of specific legislation to restore the severe losses of capital inflicted during war years on lode and placer gold miners by the shut-down imposed in a unique instance on a single industry by a government agency. To the extent they are not reimbursed, the owners should be permitted to carry forward such losses on their income tax until deducted from otherwise taxable income.

MONETARY POLICY

We continue to favor a currency with the traditional base of gold and silver, with anticipation of stabilization of the prices of these metals eventually at levels that reflect their true world values.

TAXATION

Our present tax system removes practically all incentive for effort and investment in risk enterprises, and for discovery and development of additional ore reserves. It should be promptly revised if our system of free enterprise is to function and to yield adequate production, employment and long-term government revenues.

Tax laws should be framed and administered to safeguard the interest of taxpayers as well as to obtain revenue for the Government. Taxes should be imposed only by clear mandate of law understandable by taxpayers, not to be distorted by hypertechnical administrative interpretations. Doubtful questions should be resolved in favor of the taxpayer.

In determining taxable income, time and nature of accruals should conform as nearly as possible to good accounting practice.

Corporate and individual taxes, and their combined effect, should not be such as to leave inadequate incentive for incurring risk and producing income.

In taxing dividends to individuals due allowance should be made for the corporate tax. Intercorporate dividends should not be taxed. Nothing in the nature of an undistributed profits tax should be imposed.

The maximum tax on individual income should in no event exceed 50 percent.

Taxable income for corporations or for individuals should represent only what remains after full allowance for capital recovery, and for all costs, expenses and losses.

Losses of loss years should be fully deductible in determining income of years of income, with the same effect as if the income year and the loss year constituted a single taxable period.

Depreciation and depletion claimed by the taxpayer should be allowed except to such extent, if any, as it is clearly established that they exceed reasonable allowances. The tax benefit principle should be applied so that amounts will be considered as allowed only to the extent they resulted in a tax benefit.

Costs of development, exploration and research should be allowed as part of the operating expenses of mines.

The excise tax on freight which was adopted as a war revenue measure should be promptly repealed. It is a particularly burdensome cost on the mining industry.

The social security tax rate should be fixed at the lowest level required to defray the essential costs of the system.

GOVERNMENTAL EXPENDITURES

The procedure of the Congressional Reorganization Act to provide Congress with an effective control over expenditures should be strengthened and improved.

The reduction of our tax burden to a point where it can be borne by the American people should not be prevented nor impeded by excessive or unwarranted expenditures either at home or abroad.

FREE ENTERPRISE

Free, private, competitive enterprise—by whatever name it is called—is the basis of the American way of life. As opposed to this we find, in many parts of the world, social, economic, and political systems based upon the absolute supremacy of the State. This ideology appears in different degrees under such names as communism, socialism, fascism—all having as their central doctrine the subordination of the individual to the State. We oppose such theories as destructive of freedom and of the sound principles upon which our Republic was founded, as voiced by the Declaration of Independence, the Constitution of the United States and the Bill of Rights. Without the preservation of these essential concepts, our industry cannot meet its obligations to the Nation and to the world.

Digest of Papers

Brief abstracts are herewith presented of the papers from the convention sessions. Due to space limitations, only the highlights are given at this time. Two of these papers appear in full in the current issue and others will be presented in subsequent numbers.—J.W.F.

First General Session

Future of the Mining Industry

Postwar Mineral Programs of the U. S. Government

By **James Boyd**, Director
U. S. Bureau of Mines

Dr. Boyd's paper appeared in full in the November issue of Mining Congress Journal.

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The Mining Industry and the Future for Geophysical Prospecting

By **H. R. Joesting**
Section of Geophysics
U. S. Geological Survey

ALTHOUGH geophysics has played a major part of the exploration of our petroleum resources, the science has not been a spectacular success in our search for minerals. This state of affairs is somewhat anomalous since the theoretical potentialities of geophysical prospecting for minerals are greater than those for petroleum, inasmuch as greater variety of methods is available. Although most ore bodies are small by comparison with oil structures, and their complex shape frequently makes interpretation of geophysical measurements difficult, the major reason for the failure of geophysics to fulfill its earlier promise is probably the fact that the mining industry has failed to push geophysical research in an aggressive manner. The petroleum industry spends more than $50,000,000 each year on geophysical exploration and if the mining industry were to spend but a small fraction of this amount annually on geophysics, results would be far ahead of where they are today.

The mining industry now finds itself in a position similar to that of petroleum industry 25 years. Mineral reserves are being depleted more rapidly than they are being replenished and the chances are decreasing for discovery of new deposits by surface geological investigation alone. There are many large areas which are geologically favorable to the occurrence of ore and geophysics offers a means of exploration in these regions.

Geophysical methods of exploration have been used with considerable success in Scandinavia, Finland, the Soviet Union, Canada and South Africa. The Soviet Union, although far behind this country in petroleum exploration, is far ahead in mining exploration, according to reports of foreign geophysicists.

In this country, unlike several foreign countries, mineral exploration is primary the concern of private companies and individuals; the state plays a minor role. The future of mining geophysics in the United States therefore depends largely on the mining industry and only to a minor extent on Federal and state agencies.

In reviewing possible future methods that are likely to be used for geophysical exploration, it is doubtful if any entirely new technique will result from developments which are based upon electronics, metallurgy, and chemistry. As at present, we will continue to measure the physical properties of rocks and minerals in place and attempt to interpret them in terms of geology.

Contrary to popular belief, it seems unlikely that radar will be of direct value to geophysical prospecting since microwaves have practically no depth of penetration. Possibly the chief benefits of recent technological advances will be the development of lighter, more portable, and the same time more powerful equipment. Another benefit will be the more widespread use of automatic recording and computing instruments. Improvements and interpretation techniques, as with such instruments as the airborne magnetometer, can undoubtedly be anticipated and the use of helicopters for magnetic surveys, such as the recent application of Dr. Lundberg, may render the instrument more efficient. Of the remaining major methods, namely gravimetric, seismic and electrical, it is improbable that the first two will be widely used in mineral exploration, although they may be valuable in special cases. In general the electrical methods probably offer the most promise of future development.

It is evident that many geophysical methods are available for use in mineral prospecting. Their adequate utilization, however can be effected only by an aggressive and coordinated program of research, development, and practical application, in which the mining industry must play a dominant part.

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Possible Changes in the Mining Law Required to Encourage the Search for Hidden Ore Deposits

By **Robert M. Searls**, Attorney
San Francisco, Calif.

IT SEEMS to be an accepted view that discoveries of new ore deposits of substantial extent in continental United States are likely to be made in areas where the veins and apices are concealed by overburden, lava caps, sills, washes, lake beds, or other alluvia. Consequently intensive geological and geophysical prospecting alone will indicate their existence.

It seems apparent that the geophysical prospector requires little if any legal assistance in the preliminary stages of his exploration. However, when it comes to the next step, the situation requires closer examination. As a rule an extensive program of core or shaft drilling is required to determine whether an ore body exists, its character, extent, general limitations, and, last but not least, its apex. The question thus arises as to how may the prospector be protected against competitive usurpation of the property during the period of such drilling or shaft sinking which will necessarily precede a discovery of ore within the meaning of our present mining laws?

Our present Federal mining laws were passed at a time when the location of claims depended essentially upon the discovery of an outcrop. The essence of a valid location was the discovery of minerals that would justify expenditure of time and labor in attempting to develop it. The various states added requirements to the Federal laws and some of these may be rather onerous to the geophysical prospector. The principle of these requirements is the sinking of a discovery shaft or adit within a limit time, and

these shafts or adits are normally required to be at least ten feet in depth or length and must disclose the vein.

Some of the possible changes that might be advantageous to the geophysical prospector can be indicated as follows:

(a) The preliminary location of an entire area desired to be drilled or prospected, might be increased.

(b) The period for perfecting a discovery and sinking shafts required by state laws might be increased by Federal law to six months or one year.

(c) As an alternative to this, Federal law might entirely eliminate the requirement for discovery shafts or adits on claims located through geophysical prospecting.

(d) If provisions for a large preliminary location were made, it would seem desirable that provision also be made for the automatic lapse of rights acquired under it at the end of a definite period, except in areas which the prospector should determine to locate within the period under present mining laws.

(e) There should be some definite requirement for prospecting work and the expenditure of some definite amount on each location to keep it valid. Such information should be filed at some point accessible to all, presumably at the local county recorder's office.

(f) There should be a requirement that locations under the present mining laws be promptly made as soon as each lode is discovered.

A bill which has been introduced by Senator Murray and by Congressman Engle deals with some of the above suggested changes. The bill in question (Senate 453 and H. R. 1694) has many objections. It eliminates the extralateral rights, requires the disclosure of all prospecting results to the United States Bureau of Land Management, requires an enormous amount of paper work and mapping; and last but not least, appears to involve the possibility of Federal interference with locator's rights.

The authors of this legislation desire to sponsor exactly the legislation that the mining industry wants. The policy as to whether or not the industry should accept this friendly offering and proceed further is something that American Mining Congress members must decide, and that decision will undoubtedly be based upon the expressed opinions of operators who are familiar with the problems involved.

— *Discussion* —

Reno H. Sales (*Chief Geologist, Anaconda Copper Mng. Co., Butte, Mont.*) The prospector of the future, whoever he may be, is facing many difficult problems. He will require every possible encouragement and, as Mr. Searls points out, the first and necessary step is to provide this prospector with something to start on. He will require some type of mineral location permit that will allow him to hold the prescribed area for a long enough time to make a discovery of mineral of sufficient value to validate his location under United States laws.

I am definitely in favor of eliminating the extralateral right feature for future mining locations. Why burden the locator with the expense of locating the position of a deeply hidden apex? The square claim without dip rights has worked well in Canada under conditions where there is everything from solid rock exposure to thick coverings of glacial drift. As to the initial prospecting method, it should be left entirely to the prospector whether he uses geophysical surveys, drilling, shaft sinking, or tunneling.

Right now our concern should be how to find additional deposits of minerals, not how to make it more difficult for the prospector. In our consideration of the first step in this program, that of preparing a mineral location law that will encourage the search for hidden deposits, we must not fail to recognize that we are dealing with extremely difficult prospecting problems and that the cost of such work is much higher than has been the case in the past.

Donald A. Callahan, President, Callahan Consolidated Mines, Inc., who as chairman of the Resolutions Committee united the industry in a strong declaration of policy.

Ira B. Joralemon (*Cons. Engr., San Francisco, Calif.*) Since you do not know where it is, since you do not know what you are going to find, and since it is going to cost an awful lot of money to prospect by geophysical means, no one can afford to undertake geological and geophysical exploration of the future unless he is protected in the ownership of any ore body he is likely to find. Therefore, I think that any law that will make worthwhile the development of hidden reserves, under covering material that is not mineralized, must make it possible for the company that does the work to control and to have prior rights on several square miles of area. This isn't a theory; this has been the case in Canada. As a result of a liberal law, in the last ten years in Canada, at least 17 major ore bodies have been discovered, most of them with the help of geophysical exploration. In the United States, in spite of the fact that not much geophysical work has been used, 15 major ore bodies have been found. We must depend more and more on the development of hidden deposits. To do this we must have some law similar to the Canadian law which permits prospecting rights to a greater area.

William A. Evans (*Attorney-at-law, Phoenix, Ariz.*) Our existing mining law, developed in the early days of the west, is predicated primarily and basically on the theory that discovery establishes the basis for the mining right. With geophysical developments we will require a different approach.

The present mining law presupposes that the top of the ore deposit or apex could be located as result of a surface examination. However we are now dealing with hidden apices that are frequently far beneath the surface. The extralateral right, which gives the miner under the existing laws the right to follow his vein on its depth beyond its edge line and beyond the side line of his claim, can be a two-edged sword. It gives the right to the adjoining claim owner to pursue any vein, the apex of which is located within his boundaries, beneath the property of the adjoining mine owner. The Murray-Engle Bill expressly limits the right of the locator to his boundaries, naturally projected downward, and I believe that this is a limitation which should deserve consideration by those responsible for drafting and presenting any legislation on this subject.

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Fostering A Strong Domestic Mining Industry

By Otto Herres, Vice President Combined Metals Reduction Co.

WE are concerned with the question of how to foster a strong domestic mining industry in a world that has been moving toward greater political controls over production and trade. Twice within the past thirty years we have been forced to participate in world wars against the overwhelming desire of the American people to live in peace among themselves and with all nations. Today we are faced with realization that unless law and order are restored among troubled peoples everywhere, we shall become involved in further conflict.

Minerals, metals, food and industrial production are essential to the economic strength of the nation in both peace and war. A peaceful world is required if industry is to prosper and if living standards are to advance. War solves no problems but serves only to create new cares and responsibilities and the consequences are the destruction of irreplaceable mineral resources, many of which have been used up and sent to the bottom of all the seas to accomplish the destruction of ships, harbors, factories, homes, and railroads built by the toil and savings of generations of workers.

In a world suffering from poverty and lack of food, the remedy is production. Production requires fuels for industry and transportation, and the fuel of the world's great troubled spots is coal. England is an industrial nation which was made great largely because of the spirit of her people and the natural resources in coal. Today the British mining industry has been allowed to weaken and the consequences are critical to the entire world.

We hope that our government may learn from the mistakes of others and help us maintain a strong and dependable mining industry.

In our administration of natural resources there is a divergent trend in the government attitude on subsidies. Support is given to agricultural prices and subsidy programs include sugar, subsidies for cane and beet sugar growers in competition with Cuba. Is support and protection for the mining industry, without whose metals and minerals there can be no effective defense or security, any less essential? Although I would much prefer it if the national economy could get along without any subsidies whatsoever, consistency at least requires equal consideration and even treatment for different segments of our economy when the public interests is concerned. What methods are more desirable for encouraging exploration and development of new ore-bodies than the offering of an incentive to the prospector and small mine operator? Are we to follow the policy of nationalization of mineral resources? If mining in this country is to be handled in Washington, it is becoming evident that metals, minerals, and raw materials generally will be imported in a large measure and the manufacturing of the country will become more concentrated along the east coast. If this is to be the case, there will be no security for our country based on the strength of our resources, nor will world peace be maintained by our economic power.

If the administration wishes to avoid the premature exhaustion of newly discovered ore reserves, continuation of "have-not" propaganda will certainly discourage mining. The industry depends to a large degree upon the small mine operator to risk his time and small capital in return for mineral discovery. There is still plenty of mineral in the mountains of the west and if we are to foster a strong mining industry, the small operator wants to run his mine without undue interference from government boards and bureaus. He wants adequate geological maps and the assistance of the Bureau of Mines and the Bureau of Land Management and the government must do its part to protect him against competitive imports produced by low foreign wages.

We require a strong stockpiling program. We need fear no premature exhaustion of newly discovered reserves provided minerals are produced and stockpiled. The cost required is relatively small and the stake involved of national survival is too great to be left to chance. The time has come when such an investment for peace and preparedness will prove worthwhile.

The free people of the world look to America for leadership. Europe taught the world the use of machinery and wasted its vast assets through wars and their accompanying devastation. Our problem and the foremost need of the world today is to keep America strong and resourceful.

— *Discussion* —

Burt B. Brewster (*Editor, The Mining and Contracting Review*). It is easy to understand the aversion of big producers to government control of their industry. However, if something is not done for the little fellow and the prospector, the big industries will eventually find themselves in a bottleneck and they will have just exactly what they wish to avoid: government control.

Sherwin F. Kelly (*Geophysicist, Wilmington, Del.*) I wish to say that there is no geophysical method of ore discovery. Both the self-potential equipment and the magnetometer will indicate certain types of formation which we hope will contain ore, but other than that, these methods are definitely limited.

In Canada the filing of geophysical data is made compulsory if the staker of the claim desires to use a geophysical survey for assessment work. He is not required to submit this data if he does not wish to use the goephysicists' work for assessment purposes. This same provision might conceivably be embodied in United States law.

I have previously commented before the American Mining Congress on the discrepancy between expenditures by the oil companies and the mining companies for geophysical work, a point that Mr. Joesting also brought up. However, it must be remembered that geophysics is not a short cut to the discovery of ore bodies. It is but one step in the progressive narrowing in the search for ore and geophysical work must be integrated thoroughly with geological data both from surface examination and from drilling. I was interested in Mr. Joesting's suggestion that the development of geophysics will be assisted by proper coordination between industry and government. I hope he means "cooperation" and not "competition."

Second General Session

Mining in Mexico; Gold and Silver

Mining Conditions in Mexico

By **Gustavo P. Serrano,** President
Mining Chamber of Commerce

THERE is perhaps no other country in which the mining industry has maintained such intimate relationship with the social, economic, and political development of the community, as in Mexico. The Spaniards, soon after the conquest, intensified the exploitation of mines through the application of iron instruments and powder and by the extraction of ores with manual winches and hoisting machines. Cortez, who was the first Spanish miner in Mexico, applied the use of water pumps in his Taxco mines. During the colonial period of Mexico, the mining industry was characterized by the almost exclusive attention given to the extraction and treatment of gold and silver.

Today Mexico is the world's most important silver producer and still ranks at present the second in antimony, cadmium and arsenic. It is third in the production of molybdenum and bismuth and fourth in the production of lead, zinc, and mercury. Mexico is also a leading producer of gold, graphite, fluorspar, strontium, and petroleum. Approximately 75,000 workmen are employed in the mining industry.

The war stimulated production throughout the country and fortunately the government has given full and sympathetic consideration to mining problems. The government is also realizing that the conservation of mineral resources is not accomplished through high taxation and other burdens, but through rational exploitation of ore deposits and the prevention of waste.

Some operators have been granted partial tax relief through special subsidies but this type of relief is only considered as a temporary measure to those in danger of complete economic collapse. Subsidies are not considered as a cure for all present victims of economic conditions nor are they considered as a healthy preventive to safeguard the welfare of the mining industry.

Efforts are being made to reform the present system of taxation and there are reasons to believe that this important problem will be given very serious consideration in the near future.

As in the United States, there have been continuous demands for higher wages throughout Mexico as well as a shorter work week and rewards for seniority. To maintain a reasonable stability of labor relations, without the constant intervention of the government or the adoption of coercive methods, and to restore true collective bargaining, we believe that it is essential to reestablish a balance of power between the employer and the labor unions.

Efforts are being made to improve railroads and highway transportation and the furnishing of a greater supply of electric power.

The prosperity of Mexico's mining industry not only is of interest to our country but also to other nations of the international community. The Mexican mining industry is willing to make all efforts possible to continue co-operating in the development of the country as well as of the other nations of the world, and we hope to have the assistance and encouragement of all interested parties in the accomplishment of this task.

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Petroleum Operations in Mexico

By Sr. Senador **Antonio J. Bermudez**
Director General, Petroleos Mexicanos

THE Mexican oil industry has for some time been trying to steer into the proper channel of sound prosperity by making the country an important oil producing center of the American Continent. We realize that for this purpose an in-

tensive campaign of exploration and drilling must be undertaken.

Petroleos Mexicanos is carrying out an extensive drilling and construction program. This will permit supplying the increased domestic demand and also to contribute in a greater scale in the international market. Since we have creditable evidence that our yet undiscovered oil reserves will enable us to collaborate in world reconstruction and to stand together with our Northern neighbor, we hope to be of service not only in time of peace, but also in the unfortunate event of new emergencies.

We estimate oil reserves at present at about one thousand million barrels—sufficient to supply our domestic needs for a satisfactory period and leave a convenient surplus volume for export. It is our intention to increase our reserves as much as possible so as to give a more consistent support to internal consumption and help the export market in a more liberal manner than heretofore.

The refineries and shipping terminals established in Mexico in the past were built primarily for the export business and as a secondary purpose to supply the domestic demands of the country. These facilities have been maintained and certain aspects have been improved. New refineries are coming into production and we are projecting a future refinery with a capacity of 30,000 barrels and a pipeline to supply it.

The increase in production of all mineral resources is compulsory for the welfare of humanity. Mexico wants to do its share in this task of primary importance which is incumbent to all nations of this western hemisphere. The carrying out of this policy means strengthening the ties of mutual friendship and good neighborliness and Mexico only asks that the materials so necessary for the development of our industry, without which we cannot expand, be sold us at this time when they are badly needed.

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The Future of Gold

By Arthur Notman
Mining Engineer and Geologist
New York City

THE world outside of the United States absorbs gold at a rate of one and a half billion dollars annually at the $35 an ounce valuation. This has taken place at a time when the advocates of managed currencies have convinced many people that gold performs no really essential function in the world's economy.

The monetary reserves of the United States are probably at, or approaching, the 1941 figures of $22,736,600,000, the all-time high and somewhat over half of the world's total gold stocks. Since this country probably produces about half the world's output of goods and services, this state of affairs is by no means abnormal. However, one wonders what the rest of the world will do as regards gold once its output increases above present levels. Apparently the world as a whole still regards gold as preferable to paper money.

Throughout history, when governments have overspent or exhausted their credit, they have repudiated their debts by various means including the use of the "commodity dollar" and the printing press. The results have usually been unfortunate and such measures are of course a violation of contract. We might well ponder how much better off the world would have been today if western civilization had maintained its currencies freely convertible to gold at fixed ratios, thus living up to its contracts rather than robbing its citizens or their neighbors on the plea of necessity.

Restrictions on the free ownership of gold belong to the same category as tariffs, quotas, and exchange controls. All are restrictions on free enterprise. All are justified by their supporters as a means to the greatest good to the greatest number—without any careful and objective long-term view of their effects.

Governments should balance their budgets by a resolute refusal to continue "deficit financing." The primary purposes of government do not include vain promises of individual security from "cradle to grave." Any government that promises such security to its citizens is spending beyond its income and offering to its people a cruel delusion.

As long as the individual can convert his paper into gold, he has some protection against the follies and dishonesties of his partner to the monetary contract. If we are not to return to the "dark ages," a period when the world's confidence in trade and credit was nil, the time has come for the restoration of free coinage of gold. It has been suggested that the United States take this step and the author endorses this procedure.

Failure to produce by many of the people in Europe can be attributed to lack of confidence on the part of the workers in the value of the currencies with which they are being paid. They cannot convert their earnings to gold; there is no assurance that their savings will be safe. All that remains is conversion to long-term consumption goods on the black market.

The prospect of any rapid increase in the world's gold reserves is growing dimmer with mounting costs of labor, materials, and taxes—all of which diminish the profits of gold mining and lessen the incentive to look for new sources of production.

To be realistic, managed currencies have replaced the orthodox gold standard and have relegated gold to the relatively unimportant function of settling international balances.

Silver's Contribution to Western Mining

By Tom Lyon, Asst. to the Mgr.
International Smelting & Refining Co.

THERE are few people in the United States who realize the importance of the price of silver in connection with the production of copper, lead, and zinc. Except for the lead-zinc mines of the Mississippi Valley, the discovery and development of the copper, lead, and zinc deposits of the United States was the result of prospecting during a period of high silver prices. The three great mining districts of Utah were discovered and operated as silver producers, although interest in the Bingham district was also stimulated by gold discoveries.

The total lead produced in the three principal mining districts of Utah (The Park City, Tintic and Bingham Districts) totals approximately 6,900,000,000 pounds together with large amounts of zinc and copper. The silver content of the ore played a very important part in this great production. It is evident that the consumers of lead have had more benefit from the silver contained in the ore than the producers themselves and in order to obtain more lead at a lower cost, they should be greatly interested in increasing the price of silver to $1.29 an ounce.

In the Coeur d'Alene district of Idaho, from 1884 to 1945 production reached almost 11,000,000,000 pounds of lead. With this lead it also produced 419,000 ounces of silver having a value of $278,000,000, or 2.6c per pound for all lead produced. Also during this same period dividends amounting approximately to $196,000,000 were paid, or 1.8c per pound for lead produced. Thus silver paid the 1.8c per pound of lead in dividends and almost 1c per pound of lead on operating costs. Consumers had the benefit of almost 11,000,000,000 pounds of lead at a reasonable price, much of which would never have reached the market it it had not been for the silver in the ore.

A similar situation exists as regards the Pioche district in Nevada where the total value of all metals produced from 1868 to 1941 totaled in excess of $55,000,000,000. Silver accounted for 5.5c per pound of lead and represented 22½ per cent of the total value of all the metals produced.

Prospecting and the development of new ore bodies must be encouraged and increased incentive can be furnished by raising to $1.29, the price of silver. This would stimulate both the searching and prospecting for new mines and make available lead, zinc, and copper reserves in the older mines that are now too low in the above mentioned metals to be profitable at any base metal price.

Strategic metal producers held special conference Wednesday afternoon. Presiding—S. H. Williston, Vice President, Cordero Mining Co.

Third General Session

Labor Legislation and Labor Relations

Significant Featuures of the Taft-Hartley Act in Relation to the Mining Industry

By **Charles R. Kuzell**, Asst. Gen. Mgr.
Phelps Dodge Corp., and
Frank J. Ryley, Attorney-at-Law
Phoenix, Ariz.

Part I of this paper appears in this issue, starting on page 38. II will follow in January.

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What Further is Needed in a Sound Code of Labor Law?

By **Hon. Fred A. Hartley**, Chairman
Committee on Education and Labor
U. S. House of Representatives

IT has been claimed in many labor circles that the Taft-Hartley Law is a "slave labor" measure. It has been called punitive, and some have gone so far as to suggest that our endeavor was to wreck the organized labor movement. I can assure you that we had no such purpose in writing the Taft-Hartley Law. My committee alone listened to over two million words of direct testimony, went into the field to make spot investigations of labor disputes, and went out and interviewed workers at their benches. There has been no piece of labor legislation that has come out of the Labor Committee in the nineteen years that I have been a member of that committee, including the Railway Labor Act and the Wagner Act, that has received one-tenth the earnest consideration that the Taft-Hartley Law did.

I recognize that this Act still has some deficiencies. One of the most glaring is the complete misuse of the right of free speech and the right of assembly. Through the use of mass pickets and "goon squads" many workers are today prevented from making their livelihood and many private citizens are forced to suffer inconvenience. I intend to try to correct this situation when Congress reconvenes in January. I am going to propose that it be made a Federal offense to interfere with the civil rights of any workman to go to his job if he wants to work free from any harm to himself or the members of his family. I realize that there are those who say that the local laws should take care of these problems; unfortunately I am reluctantly forced to admit that my investigations show in hundreds of cases that local law enforcement is not sufficient.

My committee has also been given authority to investigate labor racketeers. Before we are finished we are going to make sure that in this nation there is no segment above observing the labor laws. The present bill also bans jurisdictional strikes and secondary boycotts. In respect to jurisdictional strikes, workers have written me by the dozens, by the hundreds, urging that something be done to end this foolishness. Unfortunately labor took no steps within its own ranks and consequently it was necessary to write in provisions in the Taft-Hartley Act to prevent these abuses. The same is true as regards secondary boycotts.

The example of Mr. Petrillo's domination of both industry and his own union should be sufficient to illustrate how far we have permitted the exercising of authority and control by one man. Petrillo will not permit a live, professional musician to appear on television, and until one month ago our Army, Navy and Marine Bands could not make records of their own music by reasons of his own decision. He has announced that when the license of our record makers in this nation expires in December, he will not renew that license. I intend to start hearings before my committee on a proposition which will deal not only with Mr. James Caesar Petrillo and the American Federation of Musicians, but will also deal with Mr. John L. Lewis should he kick over the traces again.

In respect to the section of the bill which deals with strikes that affect the national public health and safety, in my judgment this section of the law is not as adequate as it might be. I believe that one of the answers to this situation will be the application of the Sherman-Clayton Act, an Act which should also be applied in the case of Mr. Petrillo.

The present bill also prohibits strikes against the government and makes labor organizations responsible for the fulfillment of contracts entered into under collective bargaining.

I wish to remind you that every provision of the Wagner Act providing protection for the individual worker against abuses by employers is still completely intact in the Taft-Hartley Law. All that we have done is to add new protection for the individual worker, protection against abuses by labor bosses, and that is why the labor bosses don't like the Taft-Hartley Law.

We have set up a joint committee composed of seven members of the House and seven members of the Senate which will not only study the operation of the Taft-Hartley Law throughout the length and breadth of this land, but also keep a careful watch on the decisions both of the National Labor Relations Boards and its Chief Counsel. Unlike the proponents of the Wagner Act who felt it was sacrosanct and should not be amended, if we find the Taft-Hartley Act needs amendment and if we find any of the abuses charged against it turn out to be true, we are going to make corrections.

— *Discussion* —

Kenneth C. Kellar (*Attorney-at-law, Lead, S. Dak.*) Mr. Hartley and his associates in Congress are entitled to the accolades of a long suffering public. The vicious campaign launched by labor leaders against this law should be a matter of grave concern and it is disheartening to observe that most employers have made little attempt to counteract this situation. Mass picketing accompanied by intimidation, violence, murder, and mass brutality, coupled with complete disregard for property rights, has generated a fear psychology which has apparently been calculated with the intent of shackling the American laboring man to the chariot wheels of labor monopolists.

Men who wish to work are entitled to protection. The Taft-Hartley Law, as Mr. Hartley has indicated, does not meet that issue squarely. I am glad to hear Mr. Hartley's comments on the need for a separate bill and it is my opinion that the law should have provided for severe criminal penalties for violence and intimidation on the picket lines in labor disputes under Federal jurisdiction.

Closely related to the subject of terrorism is the subject of compulsory unionism. The closed shop, and its illicit offspring the union shop and maintenance of membership, thrive in an atmosphere of fear. The Taft-Hartley Act does not emancipate the American laboring man from union slavery. It is indefensible that in this democracy any man can be compelled to join a labor organization against his will. Certainly the right to work as one chooses is as inalienable as any set forth in the Bill of Rights and, had the framers of the Federal Constitution realized how far we would stray from the concept of a free people, you may rest assured that the right to work would be incorporated in the Constitution itself.

Roy H. Glover (*Western General Counsel, Anaconda Copper Mining Co. of Utah*). The cost of labor in the final analysis represents by far the greater part to the consumer of the ultimate cost of any given product. This cost is affected not only by the direct impact of wage changes, but as well by the shackling influences of unfair practices of either labor or management.

Although the Taft-Hartley Act constitutes a compromise between the House and Senate and does not embody the ideas of all of us, it nevertheless does remove the vicious features of the Wagner Act as interpreted by the National Labor Relations Board and the New Deal courts. Although some feel that the Act should be further amended to incorporate certain features, in my judgment any attack upon the law by way of proposed amendments within a few months of its enactment, and before court interpretation, would be playing into the hands of the labor fakers who have been conducting a most vicious, misleading, and unwarranted campaign of deliberate propaganda against the Taft-Hartley Act. At this stage of the proceedings it is my belief that we as employers should enter upon a program of education of our employes as to the contents of the existing law, rather than attempting to seek its amendment at this time.

Edward H. Snyder (*Pres., Combined Metals Reduction Company*). Congressman Hartley, who has just addressed us, not only deserves our commendation and

thanks for his valient fight in the last Congress, but for his continuing the battle. I earnestly recommend for your consideration the distribution to all of your employes of a pamphlet "Answers to your Questions" prepared by the Industrial Relations Council of Utah. This pamphlet contains a great deal of valuable information especially for the working man. It explains exactly what the functions of the Taft-Hartley Act are.

Although many of the fundamental rights of the employer have been restored by the Taft-Hartley Act, and it grants legal tools with which to fight racketeers, you must not forget that good labor relations are still to be obtained only by sincere interest in the welfare of your men, accompanied by square dealings.

F. O. Davis (*Treasurer, Potash Company of America*). One of the features that has been missing at all times in either the Wagner Act or in the revision, now the Labor Management Relations Act, is the fact that although provisions are made for a bargaining unit to represent the employes, and a provision is made requiring an employer to bargain, there is no provision made which requires the bargaining agency to carry out its contract. I think it would be well to require that a group, with whom you are forced to bargain, should in turn be forced to live up to its obligations.

In New Mexico this last year we got part of the answer to the union shop idea as did thirteen other states. A constitutional amendment incorporating a "right to work" bill is now about to be voted upon. It is expected that we will pass this bill. I think that if more than half of the states pass such a bill, then Congress would have the power to take steps in the formulation of a Federal law along similar lines.

First Operating Session

Developments in Milling

Heavy-Media Separation Processes —Their Present Status and Potentialities

By G. B. Walker
American Cyanamid Company

THE heavy-media separation process represents an efficient low cost method for beneficiating a wide variety of mineral products. The apparatus and flow schemes utilized for the treatment of ores are likewise applicable to the cleaning of coal. Today, approximately 2,000,000 tons per month of a wide variety of ores, metallic as well as non-metallic, are being successfully handled in this country and abroad by this process.

The first commercial application of heavy-media separation was pioneered by the American Zinc, Lead and Smelting Company at Mascot, Tenn. In 1939 a 9-ft. cone utilizing galena medium was placed in operation and this installation has since been handling up to 160 tons of ore per hour.

The separation of heavy minerals is made through the use of ferrous media of high specific gravity such as ferrosilicon and magnetite or non-ferrous media such as galena. Unquestionably, ferrous media have the widest application of any developed so far due to ease of recovery, low consumption per ton of ore treated, resistance to abrasion, a wide range of media densities, and a lower capital investment and operating costs. However, where high grade galena concentrate is available and means exist for satisfactorily marketing the galena recovered, and where the range of separation is not beyond the range which is practical for galena, it is a satisfactory medium.

Heavy-media separation processes have a wide variety of usefulness as preconcentration methods for removing gangue at low cost after coarse crushing. In general the process is applicable to the separation of sizes down to as small as 35 or 48 mesh. Regardless of the type of separatory vessel used, the underlying principles of the heavy-media separation process remain unchanged although the flow sheet may vary. The scope of the process is not limited to use of cone shaped separators however. Other shapes have been developed and used for ores presenting special problems for treatment. These separatory vessels for use in heavy-media have been invented by the engineers of the Link-Belt Company and a development of considerable promise was reported recently in the use of an Akins separator in treating ores of the Iron Range in Minnesota.

The process has been applied throughout the world and is in use at as widely scattered points as South Africa, Bolivia, Colorado, and Washington State. The process has been used for the recovery of diamonds, lead, zinc, iron ores, fluorspar and tin—to mention but a few.

Ed Bitzer (*Colorado Iron Works Company*). On the Iron Range the spiral type of separation has proved very successful. We are making a two-product separation which means that we are plagued with so-called middling material. It is necessary to reject that material in the overflow and the machine has proved very adaptable for this purpose. We found in dealing with other types of ore, such as base metal ores where it is necessary to recover the metal ore contents, it is necessary to make a separate middling product with the machine. We have a test scheduled on a garnet ore where we are going to prove or disprove the ability of the machine to maintain a constant middling product.

On the Iron Range, I believe the process will be quite popular for a few years until the so-called intermediate ores are worked out. It does not solve our iron ore problem because there aren't sufficient reserves of that type of ore to carry us for a very long time.

Progess and Trends in Mineral Dressing

By George H. Roseveare, Metallurgist
Arizona Bureau of Mines

A COMPARISON of large scale milling operations in the Southwest for the period of the two World Wars shows a marked reduction in the metal contents of mill heads over the 29 years involved. This trend is not entirely due to the non-availability of high grade ores but to a large extent to advances of mining technology, concentration, and smelting practices.

The immediate problem in mineral dressing is to compensate, at least to some extent, for the increased cost of wages, supplies, and power and this is the problem that is receiving the most attention from operators. Amongst the steps that are being taken to reduce costs are: the remodeling of existing plants, changes in routine operation by employing more mechanical devices, the use of automatic controls to increase plant capacity and assure more uniform operating conditions, and the savings in smelting costs by producing a more desirable concentrate.

Variations of carbon cyanide process are being applied in the separation of copper from lead and considerable progress has been made in removing absorbed gold from activated carbon to permit the possibility of reusing the carbon without further activation. Sulphur dioxide is also being used to assist the flotation of sulphides and may find further application.

In the non-metallic field, substantial progress continues to be made in the concentration by means of flotation and heavy media methods. The development of non-metallic operations in the Southwest and other localities similarly situated has suffered because of the transportation costs to eastern consumers. As industrial activity increases in the west, it is anticipated that the non-metallic industry will become more important.

In the field of iron ore concentration, the low grade iron ores are receiving increased attention and experimental pilot plants are operating on specific gravity, flotation, and magnetic methods. Concentration of fines by flotation of either the iron oxides or siliceous gangue is receiving particular attention. At the present time it appears that the fundamental principle of good milling practice prevails in the iron field; the recovery of the iron oxide at the coarsest size compatible with producing the grade of concentrate required for blast furnace purposes. Flotation will probably serve as an accessory process to recover the fines resulting from crushing.

Petroleum may be another branch of the minerals industry which may be affected by mineral dressing. Large tonnages of tar sands will possibly be mined by open pit methods in the future and the tar may be liberated from the sands by chemical means and concentrated possibly by flotation. In the treatment of

oil shales, improved mining methods are receiving attention and crushing to produce minimum fines is also important.

Probably the greatest unsolved metallurgical problem in treating copper porphyry ores is the so-called mixed ore problem. A low cost method of recovering oxide copper minerals by flotation would be the most satisfactory solution. Experiments are being carried out with flotation but so far very little progress has been made. The second approach to this problem of extracting copper from mixed oxidized and sulphide ores, is in the field of leaching. If the process is combined with flotation, the first requirements are for a low cost solvent and considerable experimental work is going on along these lines. Considerable attention is being given in pilot plants to the production of low cost liquid oxygen and if this becomes available in the future, a new tool will be on hand for research in many branches of metallurgy and one very important field will be the production of a low cost solvent to treat mixed copper ores.

— *Discussion* —

Max W. Bowen (*Golden Cycle Corporation*). There is one point I would like to emphasize, and that is that many of us will have to change our ways of thinking in these days of low-grade ores, high taxes, high labor cost, ever increasing cost of materials and supplies. This has been brought very close home to us at The Golden Cycle Mill where we treat the ores from the Cripple Creek District: ores which contain gold intimately associated with pyrite and to a much lesser extent with tellurides. Until quite recently, we have depended upon either roasting followed by cyanidation of calcines—sometimes, with intermediate blanketing and/or amalgamation—or by direct cyanidation of these ores—sometimes incorporating some concentration process. However, one cannot afford to roast extremely low-grade ores economically with present high costs of labor, repairs and fuel.

A lively discussion of milling problems

By laboratory experiments after the war we determined—much to our surprise—that there were a number of low-grade dump ores and quite a few low-grade mine ores that could be floated to a relatively low tailing: that is one assaying 0.01 oz. gold per ton which could be considered low enough to discard without further treatment. The concentrates from these low-grade ores are then mixed with the higher grade of ore, and those lower grade ores that will not yield a discardable tailing by flotation, and the mixture sent to the roasters. By following this procedure we are able to treat approximately 1,000 tons per day through our flotation plant, discarding 95 to 96 per cent of this tonnage directly to the tailings dam and sending 4 to 5 per cent of this original 1,000 tons per day to the roasters. Incidentally, the concentrates reduce the coal consumed somewhat as sulfur in pyrite furnishes heat during process, although there is not sufficient pyrite for a self-sustaining roast.

No one process will recover the values from many of our ores at the present time; we must seek other means whereby we can reduce costs in order to treat the lower grade ore which we have considered pure waste in the past.

Fourth General Session

Manpower and Mechanization

Wartime and Postwar Manpower Recruitment

By H. C. Livingston
The Union Pacific Coal Co.

UNTIL 1942, as was the case with most of our domestic industries, the Union Pacific Coal Co. had for many years enjoyed a lush labor market. Good-quality applicants were available, good production was the rule, and for the most part safety regulations were fully accepted. If things really became tough we might have to slip down to Kansas and ship in a trainload or two of better and experienced coal miners who had been on slow working time. We could, if necessary, loan to families sufficient funds to move their belongings and buy railroad tickets.

Pearl Harbor and a country in an "all-out" war meant a number of changes. These changes not only affected the traditional methods of mining coal but also the usual methods of obtaining manpower. Early in 1942 our labor situation began to develop quickly into a problem of serious proportions, particularly due to increased demands for coal. There was an almost complete drafting of labor supply, and the cream of our working force was taken by selective service.

Recruiting was subject to many controls set forth by the War Manpower Commission and was conducted in accordance with regulations and rules handed down from Washington or through its 12 regional offices. Furthermore, national priorities had a great effect on recruitment. They were, of course, used to good recruitment advantages by the coal industry while they were on top and they provided protection to labor supplies in areas where the industries of the moment were concentrated. However, in the long run the coal industry had rather "slim pickings."

These circumstances, coupled with the fact that coal mining is sometimes considered as a heavy, hazardous, and dirty pursuit, made recruitment for western coal mines a fast, tough, and expensive job. Recruiters had to be found; they had to be free to move hurriedly; explicit instructions required preparation; accounting procedures had to be outlined with checks and balances, and surety bonds arranged. Orders had to be written up for USES offices without discriminatory hiring restrictions, and manpower clearances had to be obtained.

Our first reaction was to pick above average and stable miners to send out as recruiters to areas with which they were familiar. This arrangement worked excellently, but only for a limited period, since the stable miner usually had home ties which prompted his early return to his family. Also the shifting of manpower pools, or the non-existence of a pool of labor in areas for which the recruiter had been chosen, often rendered him ineffective.

Next, we hit on the idea of selecting older, unattached men—not necessarily coal miners, but more along the salesman line. This was a mistake for several reasons, mainly: Exorbitant expense accounts, over-selling the job, and a very distasteful exuberant spending of large sums of company money for which they could not account.

The final methods that were used, and the most satisfactory means, consisted of our hiring a stable local fellow from the community in which he was to recruit. He was usually recommended by the local employment office manager. Generally speaking, this man knew or could find out who were the drifters, bums, and dead-beats. With suitable instructions, together with twice-weekly telephone conversations from the home office, the system worked and is humming along quite smoothly today.

During the past six years well over 20,000 men have been hired by The Union Pacific Coal Co., the bulk of which resulted from direct recruitment carried on by a staff of as many as 12 recruiters operating in 18 states during the course of a year.

Training and Safety Programs

By Lester F. Bishop
Anaconda Copper Mining Co.

IN order to obtain full benefit from increased mechanization in mines, one of the most urgent requirements of modern mining economy is that of increasing production per man. All of this can be done through training.

The training of the miner must be done by the supervising operator, the man who lays out the work, gives instructions and orders, and is responsible for the miner's work and safety. In the case of the new miner, he can be turned over to a supervisor who is informed that the new man is inexperienced. He is instructed in his working hours, rates of pay, general safety rules, names and working places, tools, equipment, working apparel and services. At the Anaconda Copper Mining Co. an experienced miner meets a new group of miners at an appointed time each day at the mining and safety exhibit, where he explains the operation procedure and equipment. The "student stopes," as established and operated by the Anaconda Co., are of great assistance during the "breaking-in" period. A new miner averages about six weeks of preliminary training and, once graduated from this part of the program, their training continues as they go mining on a regular contract under a supervisor who knows their experience record.

With an experienced miner, the operating supervisor is responsible for discipline, quality, and output of work, along with safe practices on the job. Here the safety engineer and his assistants, service supervisor, or general engineer can be of great assistance.

The training of the supervisor is one of the most important part of any such program, as he is a key man in the training operation. He represents the company, is the man who is instrumental in holding others, creating teamwork and cooperation, and the fitting of square pegs into round holes. Fundamentally, this important training of the supervisor is the responsibility of his boss but, as this boss is usually a very busy man, he can generally accomplish most in the least time through group training. This can often be done in supervisors schools, at which one or two supervisors from each mine meet at a central conference room and participate in courses covering safety, mining methods, human relations, and service. These courses are made up and given by a training group representing an operating department. At Anaconda these courses are given approximately every six months. Each course is not a repetition of the preceding one but a new course embodying the review of the old and all recent developments.

The technical graduate generally needs practical mining experience. At an Anaconda operation he applies to the general superintendent of mines to enlist in a special program and, if approved, the trainee undergoes approximately a six-months actual mining period, two months in stopes, two months in drifts, and two months in raises. Following this, the trainee spends six months in the mine sampling department, six months in the mining engineering department, and six months in the engineering research department on mining research. At the end of this time he is given a job as shift boss, providing his work has been satisfactory, and his status from then on will be the result of the application of the man's own efforts, his training, and his ability.

There is no one best method for training that will meet every situation as mines, mills, and smelters have their own individual characteristics. However, improved training will improve supervision and this in turn will improve safety—all of which are important factors in mine operation.

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Mechanization For Greater Productivity and Lower Costs—A Review of Progress and Potentialities

By L. E. Young
Consulting Mining Engineer
Pittsburgh, Pa.

WITH increasing wage rates, shortage of labor for underground operations, and the exhausting of the shallower and, in many instances, the higher-grade mineral deposits, there is urgent need for greater tonnage of ore per man-shift, improved productivity, and lower costs per unit of output. In order to accomplish this, increased mechanization is essential.

With increased mechanization there are factors that must be taken into consideration in the over-all economics of the mining pictures. One of these is the increased use of power. In one large district the connected horsepower per man employed has increased 30 per cent in 10 years while the KWH per man employed has increased 50 per cent. Another significant development is the greatly increased capital required per employe when mines are mechanized.

Recent improvements in drilling and blasting practices have done much to improve fragmentation. The use of jumbos, with the corresponding reduction in the labor costs of drilling, have justified the drilling of additional holes in order to use explosives most effectively and into improved fragmentation. Frequently, a small additional expenditure for drilling and explosives may result in a substantial reduction in the cost of loading and in the maintenance of the loading equipment.

In mechanical loading, one of the most important factors is what may be called the loadability of the material after it has been broken by blasting or caving. Where ore or rock is drilled and blasted, the size of the largest pieces, the hardness and abrasiveness of the material, and the necessity for secondary blasting, play an important part in determining the rate of loading by the machine and the cost of mechanical maintenance. Many new types of loading machines have been devised of recent years, and they have been applied to mucking in incline shafts and slopes, to the driving of large tunnels and drifts, and to both coal and metal mining.

The relationship between mechanical loading and haulage is also important. There has been increased interest in haulage by belt conveyor from producing sections to the shaft bottom, and much attention has been given to the possibility of installing belts in slopes constructed as haulageways.

Great progress has been made in mechanizing shaft and slope sinking. Special boring tools have been used for some years and recently mechanical mucking, coupled with special facilities to expedite drilling in shafts, has been an important improvement in shaft-sinking practice.

Progress should be anticipated along the following lines in mechanization:

(1) Continued improvements may be anticipated in rock drills, drill-steel, bits, drill mounting and jumbos.
(2) Continuing improvement is to be expected in all types of mechanical loading devices, including scrapers and hoists, small mucking machines, larger loaders mounted on track or caterpillars and large shovels.
(3) Improved rates of loading and transportation are anticipated. More efficient conveyors, trucks, and shuttle cars are probable.
(4) Improvement is expected in mechanical mucking in shaft and slope work.
(5) Improvement of putting down slopes and, as the strength of conveyor belts increases, there will be much greater use of slope transportation, replacing hoisting in vertical shafts.
(6) There will be more intensive use of drills, jumbos, loading machines, and haulage equipment.
(7) More attention will be paid to the use of Diesel engines underground for both locomotives and loading machines.
(8) With improvement in steel for cutting tools, the building of tunneling machines may be anticipated.
(9) As mining methods are revised, it should be possible to design or adapt machines and equipment to suit the new conditions.

Greater Productivity and Lower Costs Through Improved Mining Methods

By Ray W. Jenkins, Special Repr.
Joy Manufacturing Company

DEPENDING upon the physical characteristics of any orebody, there is usually some choice of mining method. This choice is governed by several factors among which are: ground conditions; the attitude and skill of available labor; the availability and cost of operating supplies; and the appropriate application of mechanical equipment.

From the production engineering standpoint, mining is essentially a periodic operation. Its products are available intermittently, only after a cycle of operations have been performed. To state this simply the cycle is: breaking, shoveling, and support. In analyzing mining methods by separating the cycles into their separate operations, it becomes increasingly apparent that the key operation is breaking. The largest field for improvement in the cycle lies in increasing the time available for breaking and in increasing its efficiency. An intensive study of drilling and blasting techniques has resulted in more tons per foot of hole drilled, more feet drilled per man shift, and decreased powder consumption. Important strides have also been made in the mechanical aspects of drilling, the use of the small hole bit and lighter machines and in the development of long feed machines coupled with the use of jumbos some of which are track mounted and crawler mounted and others mounted on self propelled pneumatic carriages. Tungsten carbide bits are proceeding rapidly through the development stage and preliminary tests indicate that they will be superior to steel bits on most drilling application.

There have also been many improvements in the use of equipment for the handling of broken ore and waste. It is here that mechanization finds its greatest application. Slushers have reached a high stage of perfection and the installation of shaker and belt conveyors has shown that a considerable field exists for this type of haulage. Mine car loaders are also being widely applied in development work.

For the development of standardized mining methods there is a definite trend toward returning to the use of square-set timber in those ore bodies where timber is required. The standard dimensions of the timber helps to control the mining and it is definitely cheaper to use heavier timber and avoid costly repair work.

Sand is being used increasingly where augmented fill supply is needed in stopes. The sand should have fairly good sizing so that it will not pack and enough clay binder so that it will not run when mining subsequent blocks.

Planned production can only be maintained by planned service and with the standardization of mining methods it is possible to anticipate service needs. Fill supply, timber and tool service depots, and all of the servicing requirements must be taken into account.

The time spent in analyzing and studying mining methods pays handsome dividends in increased productivity and lowered costs. Important as this is, most operators agree that their studies to date have but opened the door to future potentialities, particularly in further mechanization.

— *Discussion* —

G. T. Harley (*Manager, International Minerals and Chemical Corp.*)

Mr. Harley gave a short general description of the mechanization of the mines in the potash area operated by the International Minerals and Chemical Corporation near Carlsbad. Reviewing briefly the problems of loading, blasting, and haulage, he indicated various requirements for improvements in equipment so as to facilitate maintenance and ease the work of the repair and warehouse crews.

Fifth General Session

Industry Problems

Problems of the Small Mine Operators

By Charles F. Willis, State Secretary
Arizona Small Mine Operators Assn.

UNDER any workable definition of free enterprise, Government must keep out of business. Many problems of the small mine operator, and many answers to them, involve cooperation or assistance on the part of the Government. However, it must be kept in mind that the solutions proposed are for the relief of a condition that exists rather than a correction of the basic situation which brought about the problem. If the small mine operators had any opportunity to return to a free competitive enterprise system—the kind under which the present great mines of the country were found and developed—the problems would largely disappear and government relief would not be needed. It is only because the nation is now so far removed from the old days of free enterprise that it becomes necessary to seek remedies for the illness created.

Free competition was shelved during the war insofar as copper, lead, and zinc mines were concerned and it was necessary to have a temporary means to carry over until normal conditions as to supply and demand could be restored. Through the operation of the Premium Price Plan, mining was placed in the position where, at the end of the war, there were many things from which it had to recover before normal operations could be resumed. Consequently it is felt that a continuation of the Premium Price Plan, with understanding administration, could have bridged successfully the period of readjustment.

A stockpiling program is essential to the nation under any security program and a healthy mining industry is likewise necessary. Stockpiling could be planned to meet the current situation and give relief to many small mine operators. It need not be confined to copper, lead, and zinc but could cover all available metals.

If minerals and metals are to play their proper part in an adequate national security program it is necessary that a "Buy American" policy be followed by agencies of the Federal Government despite propaganda from eastern manufacturing centers aimed toward the abolition of the copper excise tax on foreign metal. We are not a "have-not" nation as to many of our metals, but we can be made one by shortsighted Federal policy, especially when the Government fosters acts which bring about the condition which they are predicting.

In respect to our mining laws, it should be pointed out that no revision of these laws is required. They are already simple and almost every phase has been interpreted hundreds of times by the courts. There is, however, a definite need for the education of Government agencies and their employes who are administering the use of public land, as to the intent of Congress and the meaning of mining laws.

The exposed surface of the country has been largely explored and further expansion of our mining is dependent upon what may be found below the surface. Geophysics is undoubtedly the most promising means for exploring for such new deposits and the Government can definitely assist in such research through the various state bureaus of mines.

The financing of small mine operations, from discovery to the state of regular production, is a problem which has grown increasingly difficult to handle. Under the rules and regulations of the Securities and Exchange Commission stock offerings are stock offerings regardless of the mathematical chances of success or the speculative elements involved. However, unless funds are made available with which the small mine may either be taken out of the prospect class, or proved commercially valueless, new mineral development cannot help but stagnate.

The effect of our present tax structure,

with its virtual confiscation of more than ordinary profits, is alarming to all industry but especially so to those engaged in mining. A government program of relief from taxation for new mines is a necessity. Some plan of relief from taxation of new mines until such time as original capital invested is recovered, would prove a tremendous stimulant toward the search for mineral deposits.

In respect to loans, the mine loan program of the RFC has been curtailed just at a time when it should have been expanded. If the nation is to find and develop new resources, the mine loan program should be revised with provisions for repayment of loans out of production and possibly with some government profit on the successful ventures to compensate for losses in other instances.

Due to the remoteness of the mining industry from manufacturing centers and the long distances that frequently exist between mines, smelter, refining plants, fabricating units, and the market, the mine operator is greatly interested in railroad rates. It should be pointed out that further increase in freight rates on ores and concentrates tend to create a waste of our national resources for, as costs go up, the tonnage of recoverable ore goes down.

In conclusion, it should be recognized that conservation of mineral resources is not the keeping of these resources in the ground unexplored and undeveloped, but in maintaining them as readily available as possible for use. The growing and erroneous belief that the United States is a "have-not" nation in metals and minerals is dangerous to the progress of the mining industry, and especially to the small mines who are making an effort to show that the nation is not in this class.

— *Discussion* —

Ross D. Leisk *(Gen. Mgr., Sunshine Mining Co.).* In reference to Mr. Willis' statement on the patenting of mining claims, we at the Sunshine had an experience some years ago which is most interesting. We had a mining claim that was entirely surrounded by patented ground that was very close to our operations. It was held by location, so we made application for patent and went through all the formalities. We were advised after a year that the ground was not patentable. We drove a cross-cut and did some work on what we considered potentially mineral-bearing structure within the vertical boundaries of this claim. One day we received an official document advising us that not only would the claim not be patented but that it would be held for cancellation. We applied for a hearing and presented a lot of geological testimony. After about five years we finally received a patent on that claim. I wish to add that within the last three years the structure upon which that application for patent was based has produced over ten million dollars gross in copper, lead and zinc—or copper, lead and silver.

We also did some work under contract on manganese during the war. At the end of 1945 the contract terminated and we had remnants of a good manganese orebody that we thought should be taken out while the ground was open and accessible. Entirely on our own responsibility and without a contract we completed the mining of that orebody and stockpiled the ore. We offered it to the Army and Navy Munitions Board at cost, giving them our actual production figures. After some months we were advised that the ore would be purchased for about 80 per cent of cost so we sold them the ore and sold the machinery. We are not looking for any more manganese ore in that area.

Development of the Domestic Potash Industry

By **Horace M. Albright,** Pres.
U. S. Potash Co.

POTASH is an important mineral that was a "have-not" item in World War I. The Germans had a virtual monopoly of it, but it is now one of our most abundant industrial commodities by the admission of all the authorities including two Secretaries of the Interior.

Determined not to be caught again without potash, as was the situation during World War I, and resolved never again to be a "have-not" nation with regard to this essential mineral, Congress authorized in 1926 appropriations of $500,000 for exploration by core drilling to find if possible one or more bodies of potash salts that could be mined and refined on a large scale. The largest of such deposits was located near Carlsbad, N. Mex., in 1926 by the Snowden and McSweeney Co., independent oil operators. This deposit was found before the Federal appropriations were made available, but the Department of the Interior furnished important assistance in exploration and development of the New Mexico deposits. By September 1932, the United States Potash Co. had a refinery in operation, and by 1936 the Potash Co. of America, organized in Denver, was also in production. A few years later, shortly before Pearl Harbor, the plants of the International Minerals and Chemicals Corp. were also in production in New Mexico. From these three operations and their associated refineries, over 80 per cent of all potash originating in the Western Hemisphere is produced. What can happen to an industry that turns a "have-not" item into a "have-in-abundance" item? The answer is everything in the line of investigation, regulation, inspection, restriction, prohibition and harassment.

Men in the Government bureaus directly concerned with exploration for and development of potash orebodies were proud of the establishment of this new and great industry which they had assisted. Unfortunately, there were others who were strongly suspicious and committed to public ownership of electric power, bent on more controls. Inquiries were instituted based on the assumption that the previous administration had illegally or unwisely issued permits and leases or had favored certain groups. These inquiries disclosed a clean record and that fair and impartial decisions had been rendered. At this time, prospecting permits were withdrawn, possibly a sound move to permit the new industry to become established.

Next came a Senate investigation. Starting in 1936, this was continued intermittently for four years. In 1939 the Department of Justice began a study of the industry. In a very thorough study which was made public in 1940, no violations of law were discovered and, on the contrary, the report stated that the potash industry has demonstrated clearly those factors of pioneering development, technological advance, and responsible management which represent the highest expression of American industry.

When the great war broke out in 1939, in agreement with Department of Commerce officials, the American producers cancelled contracts for export and, early in 1941, the predecessor of the War Production Board asked for voluntary cooperation in assuring high-grade muriate of potash for the chemical industry before commitment of production to the fertilizer manufacturers. This cooperation was extended at once by the two producers of chemical grade potash. During the war the American potash industry tripled its production, spending millions of its own funds and getting no Government aid except in priorities on materials for construction and quick amortization on parts of new plants built to meet war requirements.

With the ending of the war and with exploration for new potash reserves stopped, the Government suddenly realized that exploration should be resumed. Official action was taken in January 1945 when the Interior Department issued new regulations regarding potash leasing. Under the new regulations existing companies having the maximum of six leases were prohibited from having permits to explore other lands in search of potash. Furthermore, in all new leases to be issued in the future a provision was to be inserted under which the Secretary of the Interior could commandeer up to 25 per cent of the lessee's output at a wholesale price to be determined by him. Obviously, these policies were extremely restricting and the leasing laws gave no authority for these new rules.

After two years of conference and a hearing at Albuquerque in 1946, the regulations were amended in March, 1947. Now a company, even the present producers of potash, can have prospecting rights on 40,000 acres, 25,000 additional to the land which they may have under lease, and the Secretary can only commandeer 10 per cent of their output. We still contend that these restrictions as to exploration and Government purchase of 10 per cent of a lessee's output are illegal or, at least, extra-legal.

Once more we come to Congress and what is going on there to affect potash production. Senate Bill 1251, in Title IV, would authorize the Department of the Interior to declare potash and phosphate lands to be public trusts and, if any part of a lessee's lands are covered by one of these trust orders, the Secretary can refuse to renew a lease as provided by the Potash Leasing Act. Also the Secretary is authorized to commandeer any part of a lessee's output, short of all of it. This is the bill that would put the Government into the business of potash and phosphate mining and refining and the manufacture of fertilizers.

The American Mining Congress and its membership and their officers should oppose all legislation of this nature and should do all in their power to convince the Secretary of the Interior, who is certainly an able administrator and engineer, that the United States Geological Survey and the Bureau of Mines under their expert leaders can and will administer the leasing laws strictly as enacted by Congress; that now when we want to be a "have" nation in all essential metals and minerals is not the time to introduce reforms devised by legal and economic advisors who have had no experience with the hardships, obstacles and hazards encountered in the mountains and deserts in finding and developing our mines.

Second Operating Session
Mining Progress

Mining's Postwar Problems in Federal Taxation

By Henry B. Fernald
Loomis, Suffern & Fernald

OUR system of free enterprise and initiative has shown that it is and can be the most productive system in the world, but it is a system which depends for its success in giving incentive, incentive for efforts, energies and abilities, incentive for capital investments. To get this incentive, what is necessary? I have found that what is taken by taxation does not furnish incentive. It is what remains after taxes, and that alone, which gives the incentive we need.

I want to speak particularly about our federal income taxes and to tell you that we cannot maintain our Government revenues unless we maintain the system of incentive for creation of incomes. True, we can for a short while impose taxes on existing business, on non-creative incomes, on capital; but taxes on capital, taxes on income which do not leave incentive for continual replacement of income, soon dry up the sources of our revenues, and if taxes thwart or kill the incentive we are going to reduce Government revenue.

We say that taxes should be reduced so that in no case will taxes take more than 50 per cent of the income. We think that is the maximum; possibly it is too high. In taxing dividends, we say due recognition should be made for the corporate tax already paid. Corporate dividends should not be taxed. Dividends to individuals should be exempt to the full extent of the corporate tax. The first step should be the prompt enactment in the law of a provision to exempt dividends from the rate of tax prescribed in the first bracket.

Speaking of depreciation, I will just say very briefly that depreciation should not be considered as allowable except to the extent that its deduction effectively reduces the amount of tax otherwise payable. We do not recover cost of plant equipment except out of profits, not out of losses. The amount claimed by the taxpayer should be allowed regardless of rate, regardless of particular theory or system.

Operating losses should be fully deducted. We have taken the position that we should retain the two-year carry-back and we should allow a carry-forward of at least five years. As to depletion, I am not going into detail, but I do not think that the Treasury has any particular disposition to dispute the principles of discovery and percentage depletion.

Taxes of themselves never provide incentive but they can cripple or kill it. I know taxes are not the only item we face and that there are many other difficulties, but if all other conditions were favorable, still taxes could cripple and impair our mineral industry. This situation is too little understood by the people. We must make it better understood by them. We must make it our business to see that it is brought to the attention of the people and is better understood, and I think if we get together we really in such form that we can to a large measure restore incentive.

The Application of Hard Materials For Rock-Cutting Bits

By R. W. Adamson
Ingersoll-Rand Co.

Part I of this paper appeared in the November issue of Mining Congress Journal and part II will be found on page 46 of this issue.

— Discussion —

By Philip McKenna
President, Kennametal Inc.

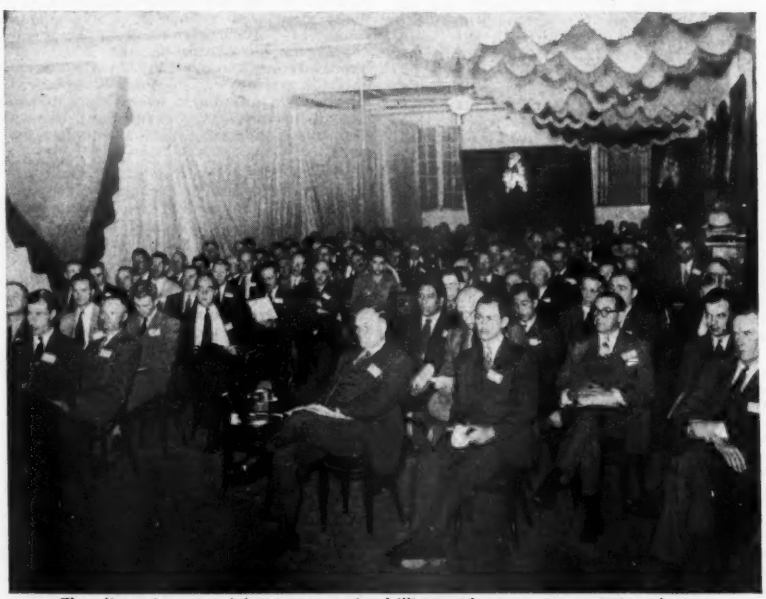
This discussion is printed in full starting on page 49 of the current issue.

R. J. Mechin *(St. Joseph Lead Co.)*: Although Mr. Adamson mentioned only 16 bits, we tried out 64 others with very satisfactory results, particularly on the 60-pound jackhamer. They were not as effective on three-inch drifters, but the last 16 that we had worked out very well. We found that men liked the bits, and we are pestered every day by the fellows who worked on these tests who ask, "When are we going to get more of them?" We feel that in our particular type of ground these bits have a decided commercial possibility although we hope, of course, that the price will come down.

Progress in Fusion Drilling

By Verne D. Johnston
Mining Engineer
Oglebay Norton & Co.

UNFORTUNATELY, the work that the Linde Air Products Co. has been doing on fusion drilling has not been sufficiently correlated this year for the presentation of a comprehensive paper at this time. Before the last war Linde Air carried on experimental work in fusion drilling; first at the Soudan iron mine at an Oliver Iron Mining Co. underground operation on the Vermillion Range, and then on surface at the property of Reserve Mining Co. on the Eastern Mesabi Range. Neither of these attempts were very satisfactory. Then they were only equipped to pierce horizontally a 1½-in. hole about 6 ft. deep, and when they encountered a wet fissure in the rock the flame would usually go out. At that time it was



The discussion on mining progress in drilling and open pit operation drew a capacity audience

thought that a flux was necessary, especially to penetrate the beds which were rather rich in iron oxide.

During the winter of 1945-46 the Linde Air Products Co. again began research work at their Tonawanda laboratory and found that they could put down a vertical hole easier than they could a horizontal hole and that they would probably have no trouble in reaching a depth of 50 ft. The published results of their work in 1946 is already public knowledge. On Reserve's property several holes around 6 in. or more in diameter were pierced, some at a speed of about 17 ft. per hour.

Concerning the work that is going on this year, I can say that there has been great improvement in the technique of this fusion drilling. A succession of holes were put down across the iron formation and the speed of drilling was greater and more uniform. Much of the time involved was that of moving the rig from one hole location to another. These holes were not troubled by water; nearly all either hit the water table immediately or started in water and went right on down as though no water existed. I understand that the temperature of fusion piercing has been stepped up from about 4,500 degrees Fahrenheit to over 5,000 degrees Fahrenheit. A flux is no longer required. Only kerosene and oxygen are used with the latest development in burners. The estimates of cost of this piercing can vary greatly on account of the great variation in oxygen costs.

A statement crossed my desk just before I came to El Paso showing the record of a series of 38 holes totaling 1,188 ft. (average depth 31.2 ft.). These holes varied in diameter from 8 to 10 in. and were put down at an average speed of 18.9 ft. per hour.

• • •

Engineering and Development Problems at the Morenci Open Pit

By **W. C. Lawson**, Gen. Supt.
Morenci Branch
Phelps Dodge Corp.

Text of Mr. Lawson's paper appears in full starting on page 28 of this issue.

— *Discussion* —

Paul J. Sirkegian *(Gen. Supt., Consolidated Copper Mines Co.):* In the preparation or the design of an open pit, we have found that one of the most important things to be considered, particularly if the pit is to be quite large, is the ultimate pit slope. We find that a 40-degree pit in our area is steep enough, and in many places it would have been better if we could have used 30 degrees. Another important consideration is that of stripping ratio and in designing an area for pit operation, after we have decided our ultimate pit slope, we determine many times by trial on cross-sections where the stripping ratio would exceed four to one. We then design the ultimate pit that would result and calculate the average and usually, in our particular area in mining, we arrive at something like two and a half to one as a stripping ratio.

As regards the choice of equipment, we believe more or less along the same lines that Mr. Lawson reasons. In our country, about 2½ per cent grade against the load is the limit, and curves usually do not exceed 16 per cent.

We agree definitely with Mr. Lawson that when haulages exceed half or three-quarters of a mile and the tonnages are large, rail haulage with larger equipment saves in over-all costs of removing material. However, the use of trucks in conjunction with large rail operations is, in our opinion, definitely in the picture.

• • •

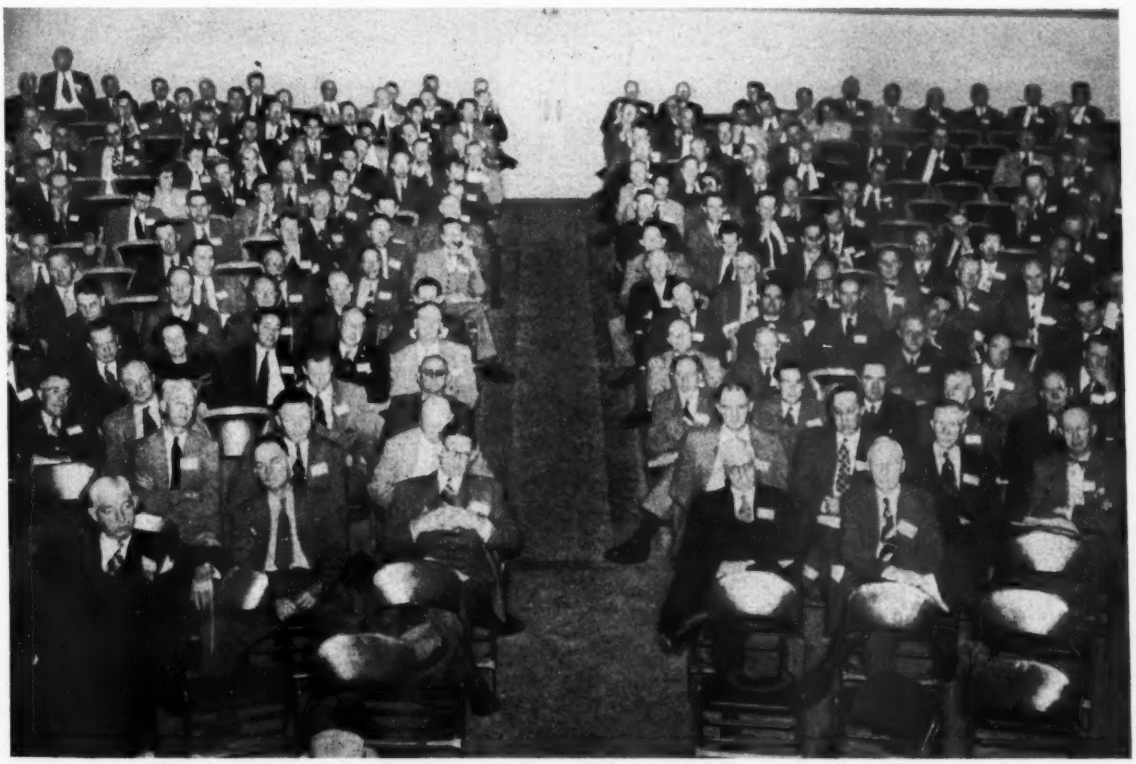
Carbon-Cyanide Treatment of Gold Ores

By **Royce A. Hardy**, Consulting Engr.
Getchell Mine, Inc.

and

F. W. McQuiston, Jr.
Metallurgical Engineer
Newmont Mining Corp.

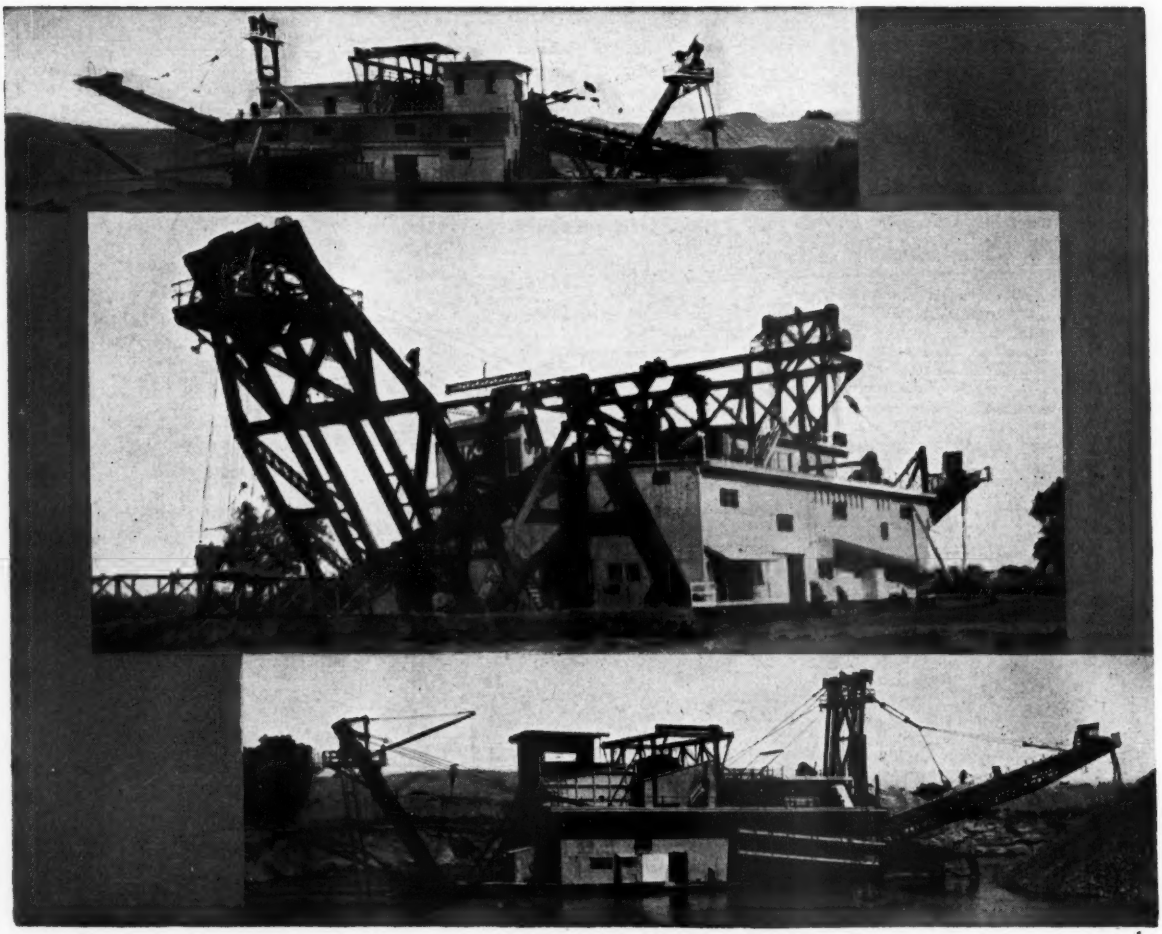
This paper was printed in full in the November issue of Mining Congress Journal.



All sessions were well attended. Above, delegates listen attentively to discussion on manpower and mechanization

FLOOD CONTROL...

With Gold Dredges



THREE CALIFORNIA YUBAS WITH A COMBINED AGE OF OVER SEVENTY-FIVE YEARS. DREDGES LIKE THESE NOT ONLY DIG GOLD BUT AID IN RECLAMATION WORK WHEN NECESSARY IN THEIR AREAS.

YUBA DREDGES — PROVED DEPENDABILITY THE WORLD OVER

Dredging ground in California since 1898 has averaged about 12 cents per cubic yard in value, according to reliable published figures. Despite this amazingly low value the California gold dredging industry has been a steady producer of new wealth for a period now approaching its fiftieth anniversary. The greater part of placer gold bearing ground is of little value for any use other than mining.

An important part of river dredging in California is done in cooperation with state and federal authorities. Levees built during gold dredging operations confine rivers to deeper channels and help to minimize the overflowing of streams like the Yuba, Feather and American Rivers. Other areas are protected from flood waters which in the past have reduced good orchard land to silt covered waste deposited there by currents carrying natural eroded material from upstream sources.

Yuba's experience includes the design and construction of gold dredges for special operating conditions such as exist in California. You can consult the Yuba organization concerning any placer dredging problem with assurance that full and accurate information will be furnished.

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Personals

F. A. Linforth, formerly assistant to the manager of mines of the Anaconda Copper Mining Company, has been appointed an assistant to the vice president of the same company. In his new position Mr. Linforth will perform special duties in connection with mining and metallurgical operations of the company, headed by E. S. McGlone.

A native of Butte, Mont., Mr. Linforth took his first position with the Anaconda Company in 1906 and became assistant to the manager of mines in June, 1936. He is a graduate of the University of California with a degree of Bachelor of Science and mining engineering.

Joseph E. Moody was recently elected president of the Southern Coal Producers Association, with offices in Washington, D. C. Mr. Moody, formerly industrial relations manager for the York Corporation of York, Pa., succeeds to the post vacated last December by Edward R. Burke.

J. V. Reynolds of Joplin, Mo., vice president and manager of the Century Lead and Zinc Company, has taken over the active management of the Royal mine properties and mill of the United Zinc Smelting Corporation in the southeast portion of the Picher mining field.

He succeeds D. G. Harrison of Joplin, Tri-State manager of the corporation for many years, who will be retained in a consulting capacity.

Robert O. Schoor has been appointed assistant general manager and general superintendent of operations in Ohio for Warner Collieries Company. Prior to entering military service in 1943, Mr. Schoor was superintendent of the company's Camel Run mine. Following discharge from the Marines in 1946 he became associated with J. W. Woomer and has been with his organization until this present appointment.

Raymond F. Robinson has resigned his position as geologist for the Federal Mining and Smelting Company of Wallace, Ida., and has been named resident geologist for the Sunshine Mining Company of Kellogg, Ida.

Following meetings of the boards of Glen Alden Coal Co. and its sales subsidiary, The Delaware, Lackawanna and Western Coal Co., it was announced that **Charles F. Huber** of Wilkes-Barre had tendered his resignation as chairman of both boards, effective October 31. He remains, however, as a member of both boards. Mr. Huber's resignation draws the curtain, if only partly, on 60 years of active participation in industry, during which time by his own efforts and abilities he climbed from the engineering department of the Lehigh & Wilkes-Barre Coal Co., not only to the top of two large coal companies, but to important official positions in the interests of the industry as a whole.

James L. Bruce, Los Angeles, has resigned as general manager of Cyprus Mines Corporation after 22 years of service. He will continue on the board of directors as vice president and become consulting engineer for the company. Mr. Bruce was at one time manager of the Butte & Superior Mining Company and then manager of the Davis-Daly Copper Company in Butte, and is well known to the mining fraternity of Montana.

Wimpfen Named Editor of Mining Congress Journal

SHELDON P. WIMPFEN

SHELDON P. WIMPFEN has been named editor of Mining Congress Journal effective January 1, succeeding Julian W. Feiss, who has been appointed as assistant to the Director of the U. S. Bureau of Mines.

Mr. Wimpfen brings to his new position a broad background of experience in the mining industry as well as in the field of industrial journalism. For the past two years he has been assistant editor of Mining and Metallurgy, monthly publication of the American Institute of Mining and Metallurgical Engineers, serving the coal, metal, non-metallic and petroleum industries.

Following graduation from the College of Mines and Metallurgy at El Paso, Texas, in 1934, Wimpfen worked as a miner, mucker and timberman at several mines in Colorado and Arizona, and then returned to Texas to the Presidio mine of the American Metal Company, where he progressed to the post of mine engineer.

In 1937 he went to the Philippines, where he spent a year in exploration and development work in Mindanao, and three years at the Balatoc mine, near Baguio. Leaving the islands a year before the Japs struck, he returned to the American Metal Company of Texas as mine foreman, and then became assistant superintendent of a gold mine in Oregon. Following the closing of this property, due to Order L-208, Mr. Wimpfen worked at Potosi and Pulacayo, Bolivia, and then returned to the United States to join the armed services. He saw action with the Marine Corps in the Pacific theatre and upon discharge joined the staff of the A. I. M. E.

His wide acquaintanceship and editorial experience make him particularly well fitted to serve as editor of Mining Congress Journal.

Consolidation Coal Company (Ky.) has announced the appointment effective November 17 of **John R. Pack** to the position of assistant secretary, thus filling the vacancy created by the death of Frank H. Price. Mr. Pack entered the employ of the company at Van Lear, Ky., in 1926 and worked at Jenkins in various capacities until his recent appointment as chief clerk in the operating department.

Howard O. Gray, mining editor of the *Joplin Globe* and *News-Herald* for more than a decade, has been elected secretary of the Tri-State Zinc and Lead Ore Producers Association. He succeeds Fred F. Netzeband, who resigned, effective last June 1, to accept a position as consulting engineer in industrial hygiene, ventilation and safety for three Utah mining firms.

Paul R. Porter of the United States State Department has been elected chairman of the coal committee of the European Economic Commission.

The election of **William Embry Wrather**, of Washington, D. C., as president of the American Institute of Mining and Metallurgical Engineers was announced at the meeting of the board of directors in New York on November 19. Dr. Wrather is the director of the United States Geological Survey.

James F. Bisset, controller of the Pittsburgh Consolidation Coal Company, Pittsburgh, and **W. R. Dunn**, assistant controller of the Colorado Fuel and Iron Corporation, Pueblo, Colo., have been elected to membership in the Controllers Institute of America.

The United States Atomic Energy Commission has named **Dr. John K. Gustafson** of Salt Lake City as director of its newly established Division of Raw Materials, effective December 1.

Dr. Gustafson was born in Chicago, Ill., in 1906. He has been associated with various mining concerns in the United States, Canada, and Australia since 1930, and from 1942 to 1944 was an advisor to the Metals Reserve Company, Washington. Since 1944 he has been with Magma Copper Company, Newmount Mining Corporation, and associated companies. During February to August, 1947, he was on leave of absence from Newmount to do consulting work for the Zinc Corporation, Ltd., of Australia.

Harry J. Wolf has become associated with Behre, Dolbear & Co., consulting mining engineers and geologists, 11 Broadway, New York.

L. Ebersole Gaines, president of the New River Company, was elected president of the National Coal Association at their last annual meeting. He succeeds **Fred S. McConnell**, who has served for the past four years.

Henry L. Pierson has been elected secretary of Freeport Sulphur Company by the board of directors, Langbourne M. Williams, Jr., president, has announced.

Mr. Pierson is a graduate of Princeton University and of the Columbia University School of Law. He has been assistant secretary of Freeport since 1939, except for a period from 1943 to 1945 when he was on leave to serve with the U. S. Army.

H. J. Hager, formerly superintendent of the Praco mine, Alabama By-Products Corp., has been appointed assistant general superintendent for all of the company's operations, with headquarters at Birmingham. **R. T. Hill**, formerly superintendent of the Barney mine at Cordova, succeeds Mr. Hager at Praco.

Horace Moses, 69, for 40 years active in the metal mining industry of New Mexico and since 1938 general manager of Chino Mines Division, Kennecott Copper Corporation, with a mine at Santa Rita and a mill and smelter at Hurley, Grant County, has announced he will retire, effective December 1. President Ray Stannard of Kennecut Copper Corpn., with offices in New York, will name Moses' successor.

Except for five years spent in Mexico at the outset of his mining career, Moses has been identified with mining in New Mexico. He started work as a pick and shovel miner at Santa Rita, with the Chino Copper Company, now Kennecott, and achieved outstanding success as a major operator and executive, advancing to mine foreman and eventually to general manager of New Mexico's largest mining operation.

For ten years prior to becoming Chino Mines general manager, he was superintendent and general manager of the Kennecott Corporation's coal properties at Gallup, McKinley county, New Mexico, operated by a subsidiary corporation, the Gallup-American Coal Company.

— *Obituaries* —

David M. Spratt, chief engineer, Snyder & Swanson, Inc., was killed in an airplane crash near Youngstown, Ohio, November 12.

Mr. Spratt had been associated with Snyder & Swanson, Sunnyhill Coal Company and Sunnyhill Mining Company over 18 years, serving in various capacities and at the time of his death was chief mechanical and construction engineer.

A. T. Thompson, 72, who retired as secretary-treasurer of Phelps Dodge Corporation in 1936, died of a heart attack at his home in Warrenton, Va., on October 28. Early in his life Thompson was associated with such mining companies as the Arizona Copper Company and Detroit Copper Company in the Clifton-Morenci district of Arizona, and also served as treasurer of the Arizona-New Mexico Railroad prior to his affiliation with Phelps Dodge.

Samuel W. Traylor, Sr., industrialist and nationally known mining expert, died November 12 in Stuart, Fla. Mr. Traylor had gone to Florida with his wife to spend the winter. He was 78 years old.

The coal industry of West Virginia was greatly shocked to learn of the sudden death October 10 of **Herman D. Everett**, 56, president of the Princess Dorothy Coal Company, the Winding Gulf Collieries, the Ridgeview Coal Company, and the Smokeless Fuel Company. He died of a heart attack in a local railway station.

Mr. Everett served as a member of the board of directors of the National Coal Association from 1943 to 1946, and at the time of his death was an active member of the National's Marketing Committee. He was a former director of Appalachian Coals, Inc.

John Robert Van Fleet, chairman of the board of United States Vanadium Corporation, a unit of Union Carbide and Carbon Corporation, died at Tucson, Ariz., on November 10, after an illness of several months. He was 66 years of age.

Mr. Van Fleet was born at Bedford, Iowa, in 1881. He studied mining engineering at Yale University.

Mr. Van Fleet began his association with a unit of Union Carbide and Carbon Corporation in January, 1916.

Walter H. Wragge, "Walt" to all his many friends in the mining industry. was stricken with a heart attack November 19 while contacting one of the mining properties at Metaline Falls, Wash., and died several hours later. He was born in New York City 49 years ago and has been associated with The Timken Roller Bearing Company for the past 25 years.

NEW GARDNER-DENVER R94 STOPER

That's what you can expect from the *new*, lightweight Gardner-Denver R94 self-rotating Stoper. A companion to the famous R104 heavy-duty Stoper, it retains many of the outstanding features of the heavyweight champion—has new advantages that assure leadership in its own class.

You'll want complete details on the new R94 before buying any lightweight stoper. A demonstration from a Gardner-Denver field engineer can be easily arranged. Or write Gardner-Denver Company, Quincy, Illinois.

Perfect operating balance—*correct design assures proper relation between drilling speed and power of feed at all pressures. This drill will not "nose dive."*

Improved holding handle control—*air is regulated to the feed leg by a simple turn of the wrist.*

Protection of working parts—*automatic system of cleaning air protects the drill completely, whether throttle is on or off, against entrance of water or sludge.*

High drilling speed—*valve construction same as that in the R104. Gives comparable drilling speeds.*

Powerful rotation—*4-pawl, with reversible pawls. Fingertip control stop rotation is available—easy conversion by changing chuck end assembly and side rods.*

Integral lubrication—*integral lubricator embodied in cylinder. Flow of oil controlled through an efficient pin lubricator. Chuck end and valve chest receive metered flow of oil.*

Gardner-Denver R94 Stoper

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Wherever you find the P&H Model 1055 on the job, you'll hear owners singing its praises for the new Magnetorque swing which marks the end of swing friction trouble and costly maintenance.

No Friction . . . No Friction Problems

The new Magnetorque solves the problems of old style swing clutches . . . by completely eliminating friction.

Without mechanical linkage . . . without friction . . . without wear — the Magnetorque transmits power for both swing and propel motions — and does it better.

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Because it's smoother, faster, more responsive . . . because it permits quicker, more accurate stops and starts — the Magnetorque swing cuts wasted operating time, increases daily production and lowers yardage costs.

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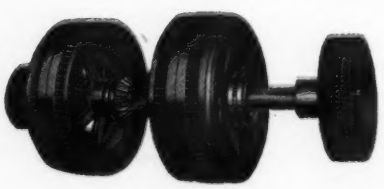
The Magnetorque is built to last the life of the machine. And during this time not so much as a single hour will be required for its repair, replacement, or maintenance.

It's one of the most important improvements in the past twenty-five years . . . users all over the country say so . . . performance has proved it. Write for complete information.



The New P&H Magnetorque Swing

Power for swing and propel transmitted by electro-magnetic forces. Operated by small generator on main engine; controlled from operator's station. Swing motions, slow or fast, have cushioned acceleration and deceleration. Because there is no friction swing, there are no friction problems. One more in the long list of P&H Added Values.

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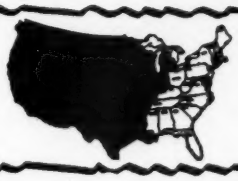


Pond Creek Opens Mine No. 5

Pond Creek Pocahontas Co. began the work of preparing the location of Mine No. 5, about half-way between Raysal and Bradshaw, on the Dry Fork of Tug River in West Virginia, on August 11. This mine, in the Bradshaw seam of the Pocahontas series, is producing coal at the rate of 200 tons per day. Presently, the production will be stepped up to 600 tons daily.

Coal is delivered in six-ton capacity monitors from the mine to the loading point, a distance of 1,200 ft., over the monitor track which has a passing track at the half-way point. There is also a supply-track from bottom to top of the incline. A monitor trip is made in about 6½ minutes.

The new mine is presently employing about 40 men.

Coal is loaded into trucks at the foot of the incline and transported to Raysal slope, and dumped into a hopper from which it feeds onto the run-of-mine belt conveyor coming from Mine No. 4. The Bradshaw coal is mixed in this manner with the No. 4 coal, and in preparation for market becomes a part of it, being blended into the sizes resulting from screening operations in the tipple. The Bradshaw is one of the premium low volatile coals; being low in moisture, ash and sulfur, somewhat below medium in volatile matter, and better than 70 in fixed carbon, it turns out BTU at the rate of 15,000-plus per pound of coal.

Coal Stripping Operation Starts

The Red Jacket Coal Corp. has begun large stripping operations in the Cary seam of Buchanan County, Va. The new operation is adjacent to the Keen Mountain Mine and was scheduled to go into production in the latter part of November. Coal will be loaded as straight run-of-the-mine and will augment the production of similar coal at Keen Mountain.

Coal Firm Using Trucks

Due to the continuing shortage of railroad cars, truck transportation has become increasingly important to the operations of Pittsburgh Consolidation Coal Co.

By using trucks for direct deliveries of coal to customers, the company has been able to partially offset the effects of the car shortage.

Trucking, of course, is not the full answer to the problem, for it is not feasible in some remote sections where the company operates. But in heavily-industrialized areas like western Pennsylvania and to a lesser extent in northern West Virginia, where customers are close to the mines, Pittsburgh Consolidation has resorted to the use of trucks to keep mining operations at a high level. In both of these sections, but particularly in northern West Virginia, the car shortage has been severe.

BCI Sponsors Radio Broadcast

Bituminous Coal Institute, now consolidated with the National Coal Association and operating as the National's department of public relations, as one of its first moves in its expanded program has contracted with Radio Station WOL (1260 kilocycles), key station in Washington of Mutual Network, to put on the air a new program, "Congress Today," in a 10-minute newscast at 6 p. m. This started November 17, the day Congress convened. It will be on the air on WOL daily Monday through Friday for the duration of the present Congress.

New Blasting Device Developed

A permissible multiple-shot blasting unit capable of firing 10 detonators connected in series has been developed by the Bureau of Mines and found safe for use in underground coal mines where gas-ignition hazards exist, James Boyd, Bureau director, announced on November 26 in releasing a publication describing the new blasting device.

Known as a capacitor-battery type, the unit was developed to meet the need for a satisfactory permissible multiple-shot blasting device of either the battery or generator type, Director Boyd said.

To insure safe operation in gassy atmosphere, the voltage on the capacitor must be reduced to such an extent that dangerous sparking does not occur after blasting of the coal face and possible release of gas, the report states.

The results of many tests successfully conducted at the Explosives Testing Station, Bruceton, Pa., indi-

cated there is little probability of igniting an 8 per cent natural gas-air mixture with a current of 50 volts or less, according to the publication. A four-volt cap-lamp battery, used by most coal miners for illumination purposes, proved a reliable source of energy for the unit. The unit will not be available for purchase for some months.

A copy of Report of Investigations 4136, "Vibrator-type Multiple-shot Blasting Unit," may be obtained free from the Bureau of Mines, 4800 Forbes Street, Pittsburgh, Pa.

New Coal Mines Open in W. Virginia

The opening of several new coal mines in West Virginia has been announced, among which the most important seems to be Mine No. 25 of the Island Creek Coal Co., located in Mingo County, and is expected to produce 4,000 tons daily. This mine is situated near Delbarton, W. Va. Mine No. 27 is expected to open if the Interstate Commerce Commission approves the application of the Chesapeake & Ohio Railway to build a six-mile spur track from Holden to Trace Fork, where the mine would be located.

Booth Mine Sold

The Diamond Alkali Co. has announced the sale of its Booth mine to the Pittsburgh Consolidation Coal Co. The mine, operated by the River Seam Coal Co., is located near Brady, W. Va., on the Monongahela Railroad.

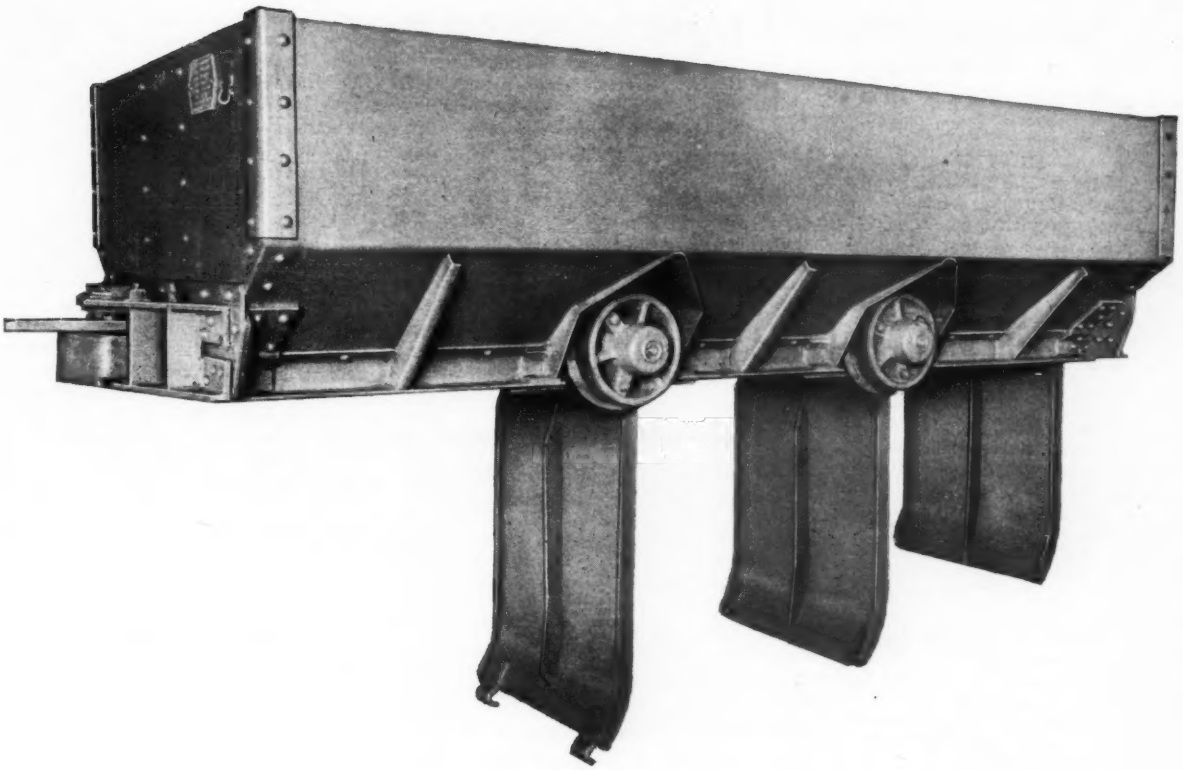
To Boost Phosphate Production

New drier facilities at the International Minerals & Chemical Corp. plant at Noralyn, Fla., will increase the phosphate processing capacity of that plant to about one million tons a year, Franklin Farley, vice president of the phosphate division, said recently in Chicago.

The new Noralyn mine and drier will increase International's phosphate capacity about 300 per cent over pre-war. The drier installation is being designed and constructed by Rust Engineering Co. of Pittsburgh and will be in operation in about a year.

The mine proper will begin production of phosphate rock in February and its output will be dried in other company facilities until the new equipment is ready.

When its present expansion program is completed next year, International's facilities alone will produce as much phosphates as was produced by all companies in the Florida phosphate fields before the war, Mr. Farley said. International's plants in Florida are located at Peace Valley, Achan and Mulberry, as well as Noralyn.



Its Face is Clean on the Latch End!

Take a look at the car above and notice that its face, on the latch end, is now clean of all unlatching mechanism. This car is our latest and most modern design of 1-2-3 automatic bottom discharge cars. It has our new "Jerk - Out" unlatching device that has completely eliminated all outside tripping mechanism. Latch lever bar which formerly extended beyond the side of car, and which had to be raised by hand or some mechanism alongside of the track, has been done away with.

The Automatic "Jerk-out" mechanism, at the bin, unlatches two independently - operated catches from underneath the car. Two latch hooks are provided for maximum safety. A simple provision is made for hand tripping cars of slate or rock enroute to tipple.

In this new car we have achieved our goal—the coal mine's most perfect mine car. The goal includes, man-less dumping—foolproof operation—greatest possible capacity for any given overall dimensions — elimination of needless dead weight — smooth running, long lasting trucks—saving in lubrication cost—saving in the cost of electricity used in haulage — maximum reduction of maintaining cars—reduction of coal breakage to the minimum. All of these results have been accomplished by the persisting effort of the engineers of the Sanford-Day Iron Works.

Write us for complete details on these remarkable developments.

20 Car loads of "Automatics" from—

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Coal Production from Western Pennsylvania

Pennsylvania State Department of Mines reports the Western Pennsylvania production for the first nine months of 1947 to be 62,571,753 tons, of which 22.5 per cent was produced by the stripping method. The report also shows that 34,532,551 tons were produced by commercial operations, of which 32 per cent was produced by the stripping method.

Fiftieth Anniversary Celebration at Morgantown

The West Virginia Geological and Economic Survey held its fiftieth anniversary celebration at Morgantown, W. Va., on December 5, 1947.

During the afternoon there were exhibits and demonstrations at the Mineral Industries Building, and in the evening, the anniversary dinner was held at the Morgantown Country Club. Gordon Gully of the Gulf Oil Company was toastmaster and the following speakers gave interesting addresses: Irvin Stewart, executive officer, Geological Survey Commission; Paul H. Price, State Geologist; C. E. Lawall, assistant vice president, C. & O. Railway; D. T. Ring, vice president, Columbia Oil and Gasoline Subsidiary Co., and Joseph M. Low, Hope Natural Gas Company.

May Become Ohio's Largest

James E. Harley, superintendent, Muskingum Coal Co. mines, recently predicted the new Leesville mine, south of Massillon, Ohio, will be the state's largest when it reaches full production next year. Harley said the mine, which began production late in October, would employ 1,000 men, producing 140,000 tons daily at full operation.

A. I. E. E. Meeting Announced

The Winter Meeting of the AIEE is to be held in Fittsburgh the week of January 26, 1948. In view of the importance of the city as a coal mining center, it is proposed to place considerable stress in the program on those activities which are of interest jointly to coal mining engineers and electrical engineers.

It is believed that members of the coal mining industry will find this program of great interest and several inspection trips of a rather unusual nature have been arranged. There is a registration fee of $2 for non-members of the AIEE but this will be waived for members of the American Mining Congress on satisfactory evidence of membership.

Bethlehem Buys Golden Ridge Mine

Bethlehem Steel Co. purchased the Golden Ridge mine near Elkins, W. Va., October 1 and coal was withdrawn from commercial sale effective October 15, according to W. K. Hallman, assistant to Vice President Jacobs, Bethlehem Steel Co. A. R. Klotten, Eastern sales manager, Fardee & Curtin Lumber Co., sales agents, confirmed the sale. It was stated that Bethlehem will step up production. The mine produced slightly in excess of 700,000 tons in 1944, slightly over a half million tons in 1945 and almost a half million tons last year.

West Virginia Mining Institute and Central Appalachian Section, A. I. M. E., Hold Joint Meeting

The 40th Annual Meeting of the West Virginia Coal Mining Institute was held jointly with the Central Appalachian Section A. I. M. E., at the Daniel Boone Hotel, Charleston, W. Va., December 12-13. It was a most successful meeting with more than 200 representatives from several states in attendance.

At the opening session on Friday morning, W. E. E. Koepler presided as chairman and the speakers covering phases of Accident Prevention and Community Health included Fred J. Bailey, Safety Director, Cardox Corporation; D. S. Butler, Insurance Commissioner of West Virginia; Dr. W. B. Wilkerson and Dr. E. Lyle Gage, president, Mercer County Medical Society.

At the luncheon J. A. Hagy of Jewell Ridge, Va., presided as toastmaster with Carrol B. Huntress as guest speaker. At the afternoon session, C. E. Lawall, Assistant Vice President, C. & O. Railway Company, presided as chairman with L. M. Morris as co-chairman. The speakers who covered various phases of mine operation were: Paul R. Paulick, consulting engineer; Pald Hamer, mining engineer, Hatfield Campbell Creek Coal Co.; Arch J. Alexander, chief, West Virginia Department of Mines, and Byron M. Bird, Jeffrey Manufacturing Company.

At the annual dinner on Friday night, J. J. Foster, Island Creek Coal Company, presided as toastmaster with Harry L. Gandy, Elk River Coal and Lumber Company, as guest speaker.

The Technical Session on Saturday morning with L. E. Tierney, Jr., and L. C. Tierney as chairman and co-

R. H. MORRIS
Newly-elected Pres.
W. Va. Coal Mining Institute

chairman, discussed problems of Labor and Management with papers by Van B. Stith, General Superintendent, Anchor Coal Co., and Ivan A. Given, Editor, *Coal Age*.

At the business meeting, the West Virginia Coal Mining Institute elected its officers for the year 1948 which included the following: President, R. H. Morris, vice president, Gauley Mountain Coal Co.; secretary-treasurer, C. T. Holland, head, School of Mining, West Virginia University; and a vice president, C. R. Bourland, assistant to vice president, The New River Co.

Patents Available

THE following patents are owned by the United States Government, as represented by the Secretary of the Interior, and are available for licensing upon a non-exclusive, royalty-free basis. Applications for licenses should be made to: Solicitor, Department of the Interior, Washington 25, D. C. The Department of the Interior does not have copies of the patents available for distribution, but copies may be obtained at 25 cents per copy from the Commissioner of Patents, Department of Commerce, Washington 25, D. C. The list of the patents are taken from the "Register of Patents Available for Licensing or Sale" published in the Official Gazette of the United States Patent Office.

Beneficiation of Beryllium Ores (two patents)
Electronic Chronoscope for Measuring Rates of Detonation
Methods of Concentrating Iron Ore
Concentrating Fluorspar by Froth Flotation
Process for Manufacturing Calcium Fluoride
Means for Collecting Gas Analysis Samples
Froth Flotation of Chromite with Fluoride
Synthesis of Fluorene and Its Derivatives
Froth Flotation of Silica From Iron Ore with Anionic Collector

United States Government Owned Patents

Electrolytic Process for the Extraction of Metallic Manganese
Water Surveying Apparatus
Purification of Rock Minerals
Sonic Flocculator and Method of Flocculation Smoke or the Like
Method and Apparatus for Separating and Concentrating Gases
Apparatus for Testing the Embrittlement Cracking Characteristics of Solutions
Means for and Method of Testing Embrittlement Cracking Characteristics of Solutions
Treatment of Ores
Liquid Oxygen Explosive
Method of Protecting Boilers and the Like Against Embrittlement
Separation of Feldspar from Quartz
Process for the Concentration of Boron Chemically Combined From Its Ores by Auto-Flotation
Recovery of Metallic Magnesium
Apparatus for Testing Flame Safety Core Drilling
Production of Potable Water From Saline Solution
Means for Producing Artificial Thermals
Method for Thermal Decomposition of Metallic Nitrates
Production of Low Sulphur Sponge Iron
Flotation of Iron Ores
Beneficiation of Beryllium Ores

For Maximum Mining Safety *plus* Ease of Operation . . .

SIMPLEX

Adjustable MINE ROOF JACKS

3 TYPES OF HEADS

Type FS: Shown on Jack at left. Flat Swivel Head is a steel drop forging for use with wooden pieces.

TYPE "C"
For square and round timbers and large steel beams.

TYPE "FF"
For small H beams and rails.

Simplex Pin-Up Jacks

These Jacks safeguard the working place while drilling, cutting, loading, timbering or laying track is in progress. They are used for supporting temporary cross timbers. Holes are drilled for 1½" pins in the rib 2' to 3' from the bottom; the forked base of the Jack slips over the pin when the Jack is set under the timbers. Originated by Simplex, this Jack eliminates the danger of knocking out posts and interference with loading machines. Available in 8 and 16-ton capacities.

For maximum safety in both mechanical and hand mining, Simplex Adjustable Mine Roof Jacks are easily set in place where tender draw slate or other soft tops present hazardous roof problems. Simplex also provides added efficiency in allowing loading machines and conveyors to work in *less space*.

These jacks may be used as temporary supports under cross timbers, steel or aluminum beams or steel rails, or for holding conveyors in place. Light in weight, they are sturdy and rugged throughout and painted aluminum for better visibility in the mine.

Model M-8 has a capacity of 8 tons, a 1½" diameter heat treated screw and 2" square tubing. Model M-16 has a capacity of 16 tons, a 1⅞" diameter heat treated screw and 2½" square tubing. Three types of heads are available, while eight sizes of each jack offer minimum heights ranging from 30" to 72" and maximum heights ranging from 45" to 87".

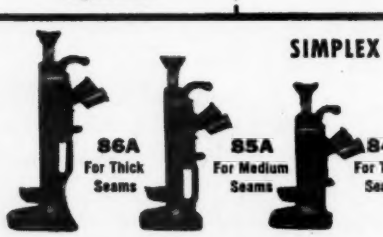
Whatever the mine jacking job, you can count on Simplex for maximum safety and ease of operating — in Roof Jacks, Pin-Up Jacks, General Purpose Jacks or any other of the many types available.

WRITE FOR BULLETIN MINES 47

This bulletin is fully illustrated and gives detailed information on all Simplex Jacks for mining work. These include Mine Roof Jacks, Post Pullers, Timber Jacks, Electrided Track Jacks, Geared Jacks, Journal Jacks, Anchor Jacks, Wire Tensioning and Hydraulic Jacks and Jennys.

TEMPLETON, KENLY & COMPANY
1042 South Central Ave., Chicago 44, Illinois

SIMPLEX GENERAL PURPOSE MINE JACKS



86A For Thick Seams

85A For Medium Seams

84A For Thin Seams

There is a Simplex Safety Speed Ratchet Lowering Jack — 5 to 35 tons capacity — for every mining job—coal cutting and loading machines, rerailing mine cars, shop and track work, etc. Outstanding features include double lever sockets; rugged cadmium plated springs and links; long, wide concave rack bar toe lifts.

Central States

Wisconsin Zinc Plant to Be Sold By Government

The Government-financed zinc concentrator, operated by the Inland Lead & Zinc Co. during the war to retreat the Coker mine tailings piles at Livingston, Wis., for the recovery of zinc, has been up for sale. The bids were closed early in November. The plant was built only a few years ago and treated the Coker tailings storage piles for zinc, the largest storage of its kind in southwestern Wisconsin zinc district.

A Record for Hanna Coal

Piney Fork mine of the Hanna Coal Co., Pittsburgh Consolidation affiliate, not only held its place as the largest underground coal producers in Ohio in 1946, according to official current report, but will produce even more fully with a long tramway that crosses a deep valley and then cuts into a hill to reach a large tract of coal will begin operation. This will mean an increase of at least one-third in annual tonnage. The state industrial relations report shows 1,020,894 tons of coal were produced at Piney Fork in 1946. As No. 2 operation, the Willow Grove mine, also of the Hanna Co., loaded 959,574 tons in 1946, barely nosing out the Rail & River Coal Co.'s Big Run plant, which was third with 956,798 tons. Another Hanna property, Dunglen, was fourth, and Powhatan was fifth. The coal preparation plant at Piney Fork also is being expanded to make premium fuel of coal of one-quarter inch size and smaller. The preparation plant of the jig type removes impurities from coal above the one-quarter inch size.

New Breakwater to Assist Iron Ore Shipping

The building of the new east breakwater at Two Harbors, Minn., on Lake Superior, and the removal of the existing breakwater, are examples of lake commerce outgrowing its original berth, with more basin area being required for the handling of the large ore boats in the harbor. The new breakwater, now under construction by the Zenith Dredge Co., Duluth, starts at approximately the same point on land as the old breakwater, but extends about 400 ft. further in a direction out toward the open lake (Lake Superior), thereby offering increased maneuverability for the larger ships in the ore trade. The new breakwater will be 1,650 ft. long, and built in depth of water to 75 ft.

Indiana Coal Laboratory Purchased

The Commercial Testing & Engineering Co. has purchased Coal Laboratories, Inc., which has been operated in Terre Haute, Ind., under the supervision of the Indiana Coal Operators Association. In the future, Coal Laboratories, Inc., will be operated as one of the branches of the Commercial Testing & Engineering Co. According to W. D. Langtry, president of Commercial Testing & Engineering Co., the Terre Haute branch will be used largely to facilitate all tests necessary for the preparation and washing of coal. He states the new addition will also augment the general coal analysis service of the company for this area.

Quincy Drilling for Ore

The Quincy Mining Co., at Calumet, Mich., is conducting diamond drilling operations in the hanging wall of the West lode. If Quincy ever resumes mining operations it is probable that new shafts will be sunk to work the Pewabic formation at reasonable depth. The old shafts are among the deepest in the district, No. 6 being 9,200 ft. on the incline.

Cleveland Smelting Plant Purchased

W. A. Singer, president of the Apex Smelting Co., of Chicago, Ill., announced on November 14 the purchase of the plant, laboratories and equipment of the National Smelting Co., of Cleveland, Ohio.

The newly acquired plant will be operated effective January 2, 1948, as the Apex Smelting Co. Cleveland plant and will produce aluminum, magnesium, zinc base alloys and other related products, enabling the company to render more efficient service to its present and prospective eastern customers. Mr. A. Rubin, vice president of the National Smelting Co., will become an officer and director of the Apex Smelting Co. and manager of the Cleveland plant as of January 2, 1948.

Walter M. Weil, president of the National Smelting Co., stated that to

AMERICAN LEGION MAGAZINE *"Third floor; slate, coal gas, rock and muck."*

insure uninterrupted production and employment, the National Smelting Co., will continue operations until January 1, 1948, at which time Apex Smelting Co.'s operations begin.

Conclude Drilling for Titaniferous Iron Ore

Two diamond drilling explorations for titaniferous iron ore have been completed in Cook County, Minn., the most northeasterly county in the state. The first drilling was on outcrops near Tucker Lake in the Gunflint Lake area, and later the drill was moved to an outcrop at Smoke Lake, northeast of Saw Bill. The former is reached via the highway from Grand Marais and the second via Tofte to Saw Bill Lake.

Steel Firms Acquire Coal Company

Frank Purnell, president of Youngstown Sheet & Tube Co.; Leigh Willard, president of Interlake Iron Corp.; and H. G. Hilton, president of the Steel Company of Canada, Ltd., have announced the purchase of all stock of Carter Coal Co.

The transaction was handled by a group associated with the purchasing companies and became effective November 25.

Operations will be resumed promptly under supervision of the present Carter Coal organization.

Ohio Mine Destroyed by Fire

A $350,000 fire destroyed the tipple at the No. 7 mine of the Midvale Coal Co., 3 miles east of Midvale, in late October, putting 275 employes out of work.

Robert W. Rutledge, owner of the mine, said that the tipple, 75 ft. high and 350 ft. long, would be rebuilt immediately.

The fire apparently started from spontaneous combustion in the slack bin of the tipple and within a few minutes spread through the entire structure.

Royal Mill to Be Custom Unit

J. V. Reynolds, of Joplin, vice president and manager of the Century Lead & Zinc Co., has announced that the company plans to operate the Royal mill near Picher, Okla., as a custom concentration unit, and, in addition to treating ore produced by small operators, will continue to furnish mining machinery and equipment to responsible miners in an effort to encourage production and stay in business until possible Government assistance is again made available.

Tri-State Mine Reopens

Preparations are being completed to reopen the Waxachachie mine, 2½ miles east of Quapaw, Okla., on a limited scale of operations. Pumping operations have been continued at the property for some time. Ore from the mine, which will be under the supervision of Floyd and Willard Craig, will be trucked to the Royal mill, southeast of Picher, which is being reconditioned.

Iron Mining Companies Plan Winter Programs

With the end of the shipping season, several of the iron ore companies in the Lake Superior region have begun their fall and winter programs of mine stripping, construction and repairs.

Butler Bros., one of the top seven producers in the region in '46, estimate that about 3,000,000 cubic yards will be removed in their stripping operations at Kevin, Olson, Galbraith and Weggum mines. Ground work will be laid for the new conveyor installation at the South Agnew mine, largest new development under way in the Hibbing district. Construction will include an addition to the main office building at Cooley, Minn., a ball mill at the Patrick ore plant, and new

buildings at the Cooley shops and the South Agnew open pit mine development.

Republic Steel Corporation's three open-pit mines on the Mesabi range, the St. Paul at Keewatin and the Stevenson and Susquehanna in the Hibbing district, are utilizing the winter months in the repair of mining machinery and equipment. In Michigan stockpiling of iron ore on the surface from underground operations has been resumed at the Penokee mine at Ironwood and the Tobin mine at Crystal Falls.

Snyder Mining Company will continue stripping operations for some time during the winter season at the Webb mine at Hibbing, Minn. At the Shenango mine, at Chisholm, underground mining of a shaft pillar is under way, while the work at the Virginia mine at Eveleth will include some blast hole drilling.

Spring Hill Coal to Be Sold by Bell & Zoller

The Bell & Zoller Coal Company of Chicago has announced the completion of a contract to handle the sale of coal from the Spring Hill Coal Company mine, located near Terre Haute, Ind.

Plans call for loading of screened sizes, together with 1¼ x ⅜-in. stoker, over the lines of the Chicago, Milwaukee, St. Paul & Pacific Railroad.

Spring Hill has been operating in the well-known fifth vein seam for the last 15 years, mining one of the highest quality products in the Linton-Sullivan District.

Michigan College to Offer Bachelor of Mining Engineering Degree

The Department of Mining Engineering of the Michigan College of Mining and Technology at Houghton will offer an additional undergraduate degree, beginning with the 1948-49 academic year. The new degree is B. Min. E.—Bachelor of Mining Engineering. The curriculum leading to the degree will require 15 terms, or quarters, for completion. The college will continue to grant the B.S. degree in mining engineering, the curriculum for which requires thirteen and one-half terms.

The purpose of the B. Min. E. degree, according to Professor J. Murray Riddell, head of the department of Mining Engineering, is to offer the equivalent of a five-year course in mining engineering which will permit a broader scope in undergraduate study and provide for the election of more courses in the humanities, engineering administration, geology, mineral dressing, and metallurgy.

Wheels of Government

(*Continued from page* 62)

by Labor Secretary Schwellenbach, advocated increase in the minimum wage to 75 cents an hour, both approved procedure to reduce the minimum as far as 65 cents per hour if such action should be found to be necessary in any industry to prevent curtailment of employment. McComb admitted that application of the broad language of the Wage-Hour Act by the courts may have resulted in a coverage under situations which the Congress does not believe is sound. In presenting testimony on the "regular rate of pay" he explained to the Subcommittee that additional overtime compensation need not be computed and paid on a bonus, the amount of which is in fact arrived at by taking a predetermined percentage of the total earnings of the individual employes (both straight time and overtime), exclusive of the bonus.

Testimony of numerous industrial witnesses urged complete repeal of the Act. Others called for its repeal except for minimum wage and minimum overtime provisions. There was general demand that the "regular rate of pay" be clearly defined, also that employes be exempt from minimum wage and overtime provisions under negotiated wage agreements. Clarification of the definition of executive, professional and administrative employes was urged and the definite suggestion was made that the Taft-Hartley Act definitions of supervisors and professional employes be substituted in the Wage-Hour Act. Exemption was asked for industries engaged in production of a purely local nature.

Over 100 witnesses have asked for time to appear at the hearings announced by Administrator McComb in the Department of Labor building beginning December 2, on the regulations relating to exemptions accorded to persons employed in executive, administrative, professional or local retailing capacities, or as outside salesmen. The Administrator has rather wide powers and could respond constructively to the determined effort which will be made at these hearings to substitute the Taft-Hartley Act definitions of supervisors and professional employes in the Wage-Hour Act. Apparently the Administrator and the Legal Division of the Department of Labor have been strongly impressed by the attitude of Representative McConnell's House Labor Subcommittee toward amendment of the Act, in response to the testimony of many witnesses demonstrating that the law is in disrepute with the large majority of American businessmen.

Deep concern of the Government over problems growing out of the Wage-Hour Act is indicated in a petition of the Department of Justice, on which the U. S. Supreme Court has granted certiorari in a stevedoring case involving $2,000,000 in back-wage liability for "overtime-on-overtime" payments. The Court will review a decision by a New York Circuit Court of Appeals which vitally affects wartime cost-plus contracts and involves Government liability for a heavy part of these claims.

An Interpretative Bulletin has been issued by the Wage and Hour Division, analyzing the Portal-to-Portal Act of 1947. The general implication of the bulletin is that the Portal Act is secondary to the Wage-Hour Act and hence limited in its application. It is highly significant to employes and raises questions that may ultimately have to be settled in the courts.

In a suit involving back-pay travel-time claims for 20,000 employes of the Bethlehem Steel Corporation, CIO United Steel Workers attorneys are attempting to upset the constitutionality of the Portal Act. The attorneys are requesting permission of a Federal District Court judge to amend their original petition to charge that the employer is liable to travel-time claims because of its agreement in its contracts "to abide by all the laws of the United States." They make the claim that the Act attempts to take away a vested right union members acquired prior to May 14 under the Wage-Hour Act. Counsel for the employer contends that an employer is not liable for such pay unless it is specifically provided for in the working contract.

Security Resources Board

The President has completed appointments to the National Security Resources Board created by the National Security Act of 1947, to advise him on coordination of military, industrial and civilian mobilization. Included in the scope of the Board's work are recommendations of policies to assure maximum use of manpower and of natural and industrial resources in time of war, together with policies for establishing adequate reserves of strategic and critical materials and for conservation of these reserves.

The Board's chairman is Arthur M. Hill of Charleston, W. Va., a transportation executive. The other members include the Secretaries of the Treasury, Defense, Interior, Agriculture, Commerce and Labor.

Diatomaceous Earth Plant Completed

A new plant fitted with the latest equipment to process diatomaceous earth to individual specifications for many industries has just been completed, T. C. Carter, Eagle-Picher vice-president in charge of insulation and diatomaceous earth products, has announced.

The fossilized remains of a microscopic plant deposited during prehistoric times, diatomaceous earth is extremely light, porous, and has high absorptive qualities. It is used in high temperature insulation, as a filter-aid for the beverage industry, and as a carrier for fertilizers and insecticides. Another of its many uses is as a filler to provide bulk and strength at low weight for paints, paper, polishes and plastics.

Located at Clark, Nev., the plant, geared to handle tailor-made grades of diatomaceous earth, will have an exceedingly large capacity. The Eagle-Picher deposit is sufficient for several hundred years' supply and suitable for surface mining methods. Location on the main line of the Southern Pacific R. R. permits economical and efficient shipping. Due to the arid climate of the region, bed moisture is usually only 15 to 25 per cent as contrasted with 65 per cent or greater which may be encountered in other areas. Air-drying, consequently, is expedited, Carter explained.

Quarrying Eagle-Picher Celatom is a relatively simple operation

Western States

New Mexico Miners to Meet

The New Mexico Miners & Prospectors Association is completing plans for its Carlsbad meeting, to take place early in January. A program will be announced in the December issue of *Miner & Prospector* magazine and will stress potash and pleasure. Trips through the caverns and the potash mines and plants are being prepared, in addition to several other original features.

Contrary to the announcement in the November issue of the *Miner & Prospector*, which went to press before plans were completely outlined, the date of the convention is January 9-10, with registration starting January 8 at 3 p. m. Hotel reservations should be made directly with the Crawford Hotel or the La Caverna Hotel and motor court reservations should be made through Victor Minter, secretary, Chamber of Commerce, Carlsbad. A total of only 100 rooms will be available at the two hotels. When these are filled rooms will be allotted at the best motor courts, which are located within a few blocks of the hotels.

Ore Showing on Utah Property

Heavy mineralization carrying substantial values in gold, silver, lead and copper has been encountered in the West Drift being projected by Mountain Mines Company at its property in Big Cottonwood Canyon, Salt Lake County, it was disclosed in Salt Lake City during November.

Now in some 725 ft. from the main lower development tunnel, the West Drift is entering an area directly below ore shoots that were formerly productive in upper levels of the mine.

As a major factor in exploration and development of the firm's property, the main development tunnel was driven in an effort to encounter at depth the Silver King vein which was responsible for important production higher up on the mountain. This lower adit was driven, during the development period, a distance of 3,172 ft. from the portal, at which distance the vein was opened. From this point the West Drift was projected westerly along the fissure.

The main tunnel cut into the mountain 2,000 ft. below the surface and approximately 1,400 ft. under the lowest downward extensions of the upper workings. Objective of this work was to undercut at depth the ore shoots productive in these upper workings.

Encountering mineralization the entire distance along the vein, the West Drift for the past 125 ft. has disclosed ore showings containing values all the way from $3.00 to $305 per ton.

Historic Colorado Mine Leased

E. L. Laycock, president of Bull Domingo Mines Syndicate, recently announced that the famous old Bull Domingo mining property, three miles north of Silver Cliff, Colo., had been leased by his company to C. Erb Wuensch and associates of San Francisco. The property was leased for a term of five years with option to purchase, a substantial cash payment being involved in the deal.

Mr. Wuensch and associates will unwater the mine to the 800-ft. level in order to examine known bodies of lead-zinc ore existing between the 250 and 550 levels.

It is the plan of Mr. Wuensch and his associates, who are officials of the Utah Construction Co. and the Pacific Bridge Co., to spend between $25,000 and $35,000 in unwatering the mine, rehabilitating the 1,000-ft. shaft, and determining the extent of the zinc-lead ore bodies, according to Mr. Laycock. If the known ore bodies warrant it, a mill to handle the ore will be constructed near the shaft.

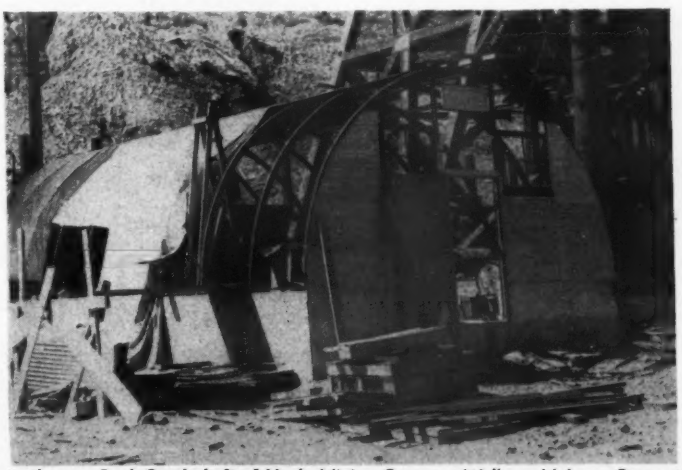
According to past history of the mine, considerable complex zinc-lead ore was by-passed during its operations in the '80s and '90s, due to the fact that such ore could not be milled or smelted in those days without considerable loss because of the zinc content.

With the present demand for lead and zinc, and the successful methods of separation of complex ores which are now in use, the Bull Domingo bids fair to add greatly to its known production record of $1,500,000.

Idle since 1899, insofar as actual production is concerned, with the exception of a few small shipments made from what is known as the Wagner shaft, the Bull Domingo has been owned by the Bull Domingo Mines Syndicate for the past 25 years.

An Experiment at Ruby Gulch

Ruby Gulch Mining Company, at Zortman, Phillips County, Mont., has completed its experiment in "coyote drift" mining and blasting to overcome the shortage of competent miners and to reduce costs. Under the supervision of Edgar A. Scholz, manager, a drift was run for a length of over 140 ft. behind the west wall of the Alabama open cut. Workmen were lowered 100 ft. over the top of the cut and blast holes were bored to a depth of from 60 to 75 ft. The Alabama open cut was 600 ft. long, 500 ft. deep and over 80 ft. wide before the round was blasted. On October 24 the openings were loaded at five points with a total of 15½ tons of duPont nitramon powder and blasted late that afternoon under the direction of Mr. Scholz and R. C. Sherman, Butte, western Montana representative of the duPont Company. The explosion broke within 3 ft. of the calculated break-line, and from 130,000 to 180,000 tons were kicked into the bottom of the pit with good fragmen-



At the new Rock Creek shaft of Hecla Mining Co., near Wallace, Idaho, a Quonset hut is used to house the compressor unit

tation. Extensive preparations to prevent human casualties and property damage were taken. However, it was stated that the ground-shudder accompanying the shot was less than that caused by blasting in an ordinary jackhammer hole and there was no sharp report. The company has been mining, coarse-crushing and cyanide leaching 300 tons of low grade ore per day. According to preliminary figures, the new method of mining was entirely successful and has substantially reduced mining costs. Mrs. K. B. Whitcomb and Mamie Whitcomb Engle, both of Zortman, are, respectively vice president and secretary-treasurer of the company; Millard Reyner is mining engineer; Max Klimper, mill superintendent; Paavo Puumala, staff engineer; Norman Larum, assayer; Gus Ehrenberg, office manager, and Hans Schroeder, mechanical engineer.

Old Alma Gold Property to Use Tunnel

Harvey Tedrow, former manager of the old London mine at Alma, Colo., will direct the Pennsylvania Project on the southern extension of the London Fault through Pennsylvania Mountain. The Pennsylvania Project is jointly financed by the London Mines & Milling Co. and the London Extension Mining Co. The tunnel on the property formerly owned by the London Butte Gold Mining Co. is being rehabilitated and will be continued on the London Fault to the southeast. Contractor Harold Cox has a shovel, bulldozer and trucks engaged in enlarging the tunnel portal and in building roads into the property. The remarkable production of high grade gold ore from London Mountain on this fault is incentive sufficient for making the drive to the southeast into Pennsylvania Mountain.

Arizona Company Expanding Operations

Operations, Inc., Tombstone, Ariz., is laying plans for an enlarged mining program and has acquired control of several additional properties. Besides its original operation, the San Juan in the Dragoon Mountains, the corporation now holds the Compadre near Patagonia, the Atlas at Red Rock, the Pine-Zinc in the Chiricahuas, and the Tombstone Extension east of Tombstone.

Ore from all claims will be shipped to the 100-ton flotation plant in Tombstone, constructed last summer and designed to handle complex zinc, lead and copper ores. When production is under way from the new holdings, the mill is scheduled to operate 24 hours daily. It is said that company officials are giving consideration to a plan for building a chemical leaching plant near the site of its present mill.

Operations, Inc., was organized early in 1947 with Guy and Gerald Mann and Len Acton, all of Dallas, Tex., holding the controlling interest. Hubert Starchman is mine superintendent.

Mines School Changes Name

The school of mines of the University of Washington at Seattle had its name changed this fall to the School of Mineral Engineering, renaming being to conform to the current trend to broaden college training to cope with after-graduation problems. Emphasis is to be placed on all-around engineering problems. There will be intensive training in personnel management, accounting, psychology, as well as civil, mechanical, and electrical engineering for students who intend to become mining engineers and metallurgists.

In speaking of these changes and the renaming of the school of mines Prof. Drury A. Pifer, recently appointed acting director of the school, cited his own broad background and experiences in South African diamond mining operations. There he was required, as a mining engineer, to construct housing for workers, provide water, food, and other necessities, and to build power lines, supervise and control payrolls, and take care of other expenditures.

Mapping Under Way in Coeur d'Alene

The United States Geological Survey has started mapping the silver belt in the Coeur d'Alene district from Placer Creek in Wallace to the Montana state line east of Mullan. S. W. Hobbs and A. B. Griggs, two U. S. G. S. geologists from the Spokane office, are now in the district and have started the geological study of rock formations as exposed in the mines and prospects along the belt.

This work has been delayed, said Mr. Hobbs, because of a lack of appropriations for the purpose, but the necessary funds have now been allocated. The study and mapping, he said, may cover a period of from three to five years. The season is so late that it is probable not much can be accomplished in surface mapping, but the Government geologists will devote their time to underground studies during the winter.

This part of the Coeur d'Alene district embraces a territory several miles wide and around 10 miles in length and is now undergoing an intensive deep prospecting campaign unparalleled in mining history. Seven independent deep-shaft developments with objectives around 3,000 feet have been started along the belt, two of which have been completed, with resulting discovery of exceptionally large and rich silver, lead and copper ore bodies as deep as 1,000 feet below sea level.

Potash Laboratory Completed

American Potash & Chemical Corp. has completed under its expansion program a $300,000 research laboratory, an office building in Los Angeles, and a subdivision of 47 homes at its Trona plant. Under construction and scheduled for completion in 1948 are a $4.5 million soda ash-borax plant and $2 million for expansion of its power plant.

Manganese Shipments Continue from New Mexico Property

The A. A. Luck Mining & Construction Company, Silver City, continues to ship a large tonnage of manganese ore to the Colorado Fuel & Iron Company steel mills at Pueblo, Colo. Entire output of the mine, an open-pit operation, is taken by the Colorado mills.

Open Pit Work on Schedule at Chino

Isbell Construction Company of Ely, Nev., which has the contract for extending open-pit mining operations of Chino Mines Division, Kennecott Copper Corporation, at its Santa Rita, N. Mex., mine, is proceeding ahead of schedule as a result of ideal weather with no working days lost since work began in July. The contract is expected to be finished within two years.

Plans to Use Alaskan Limestone Postponed

Owing to present high construction costs and ocean transportation, Alcoa has temporarily abandoned its plan for bringing Alaskan limestone to Portland, Oreg., for sale as well as its own use. Drilling has established a large lime deposit of high grade in the Edna Bay, Alaska, region, according to advice of E. A. Messer, the resident engineer at Alcoa Mining Co.'s office in Hillsboro, Oreg. Meanwhile, the company is most actively pushing its exploration of laterite deposits in the states of Washington and Oregon.

High Grade Reported from California Property

Development of rich gold ore in their Slapjack mine at Woodleaf, Yuba County, near Marysville, Calif., has been announced by Walter Bean and associates. They report that a ledge ranging from 30 in. to 5 ft. wide and assaying $150 a ton was found lately in virgin ground after sinking a shaft 60 ft. Specimen quartz has been uncovered near the surface by a bulldozer. Some of this is said to run extremely high in gold values.

Ore Shipped from Cardiff Mine

The first carload of ore was shipped in November from the once famous Cardiff Mine located in the Alta Mining District, Utah, since inauguration of the new rehabilitation program.

While the value of the ore shipped in the first car is not known, a report several weeks ago stated that lessees had taken samples at that time from this same area that showed 29 per cent lead and 10 ounces of silver to the ton.

Supplies and equipment have been placed on the property preparatory to conducting operations throughout the winter months.

Well known in Utah mining history, the Cardiff has had its ups and downs. It is generally conceded that substantial tonnages of commercial ore still exist in the property that can be made available for marketing. For this reason the present operation is being watched with wide public interest.

More Ore Shipments from Arizona District

The 100-ton flotation mill of the Athletic Mining and Smelting Company, at Klondyke, Ariz., will soon be on regular production handling both company and custom ore. The Athletic company has been active in the district for a number of months, developing the Iron Cap and Head Center properties. The high-grade ore from the Head Center will continue to go to the El Paso Smelter, but the Iron Cap ore will be treated in the new mill. Principal metal values are in lead and zinc, with some silver. The Athletic company is headed by Raymond F. Orr, president, and A. K. Orr, secretary-treasurer, both of Fort Smith, Ark. Harvie L. Horton, Safford, Ariz., is general manager, and Theodore Beatle is mill superintendent.

The Klondyke district is rapidly attaining importance in the production of lead and zinc with a number of smaller properties making intermittent shipments. Among these are the Abe Reid, operated by Lon and J. D. Rutledge, which has shipped one car of lead-silver-gold ore and has a second ready for shipment. Another is the Ora Hanna, a lead-silver property operated by Lee Cook and which has made a shipment of lead-silver ore.

Also in the same district is the Harwood mine, operated by G. C. Harwood and E. H. Lundquist of Phoenix. One carload of ore has been shipped and it is understood that arrangements were recently completed with the smelter providing for the acceptance of three carloads of ore a month. A crew of seven is employed and some new mining equipment has been acquired. Raymond Pointer is in local charge of the work.

Idaho Mine Strikes Rich Ore

Silver Dollar Mining Company has made the most important discovery in the silver belt since Polaris opened an unexpected vein of rich ore in Silver Summit ground in its 3,000-ft. shaft development. Silver Dollar has opened the "Chester" vein system, considered the main fissure of the silver belt in the Coeur d'Alene district at a depth of 2,500 ft., at which point the shaft crossed the vein, showing a well mineralized vein 6 ft. wide. The last 3 ft. on the foot-wall side assayed 46 ozs. per ton in silver. The company is continuing the shaft to the 3,000 level.

Mogollon Operations Suspended

The Bradley Mining Company of San Francisco has suspended extensive development operations at Mogollon, Catron County, N. Mex., begun two years ago in the once bonanza gold-silver camp in the Mogollon Mountains. Considerable progress had been made in the driving of a tunnel to tap new ore bodies at the lower levels of long dormant mines.

More Claims for Zinc-Lead Operations

In the expansion of its zinc-lead mining operations in Grant County, New Mexico, the U. S. Smelting Refining and Mining Company, has filed an application for patent of a group of 20 claims in the Central Mining District, totaling approximately 230 acres of mineralized ground. This is the largest single patent application filed in New Mexico in recent years.

Dam Breaks Way at Castle Dome

Mining and milling operations of the Castle Dome Copper Company, Inc., Miami, Ariz., were interrupted for a short period of time in September and October when a portion of a 40-ft. wing of the tailings dam gave way. The break, which was less serious than first reports indicated, occurred on September 26 and permitted hundreds of tons of muck and silt to wash down Pinto Creek and bury one of the pumphouses under several feet of debris. The main dam and the tailings pile were undamaged. The Castle Dome Copper Company, Inc., is a subsidiary of the Miami Copper Company and the plant was built with funds from Defense Plant Corporation during World War II to augment the supply of much needed copper.

Idaho Placer to Operate Next Spring

The Wolf-Nugent placer mining property on California Creek, a branch of the Salmon River just south of the Buffalo Hump country, is to be operated by the Cal-Creek Placer Mining Co., of which W. W. Wick of Ellemclaw is president.

The property is a virgin territory consisting of 800 acres and is estimated to contain 92,000,000 yards of placer gravel and is located between the town of Florence and Warren, both of which are famous old placer camps. Florence has record production of $81,000,000 in placer gold and Warren a record of $62,000,000. The company will start placer operations in the spring with Mark Evans, E.M., in charge of the work. The operation, according to Evans, will be of hydraulic character.

MANUFACTURERS FORUM

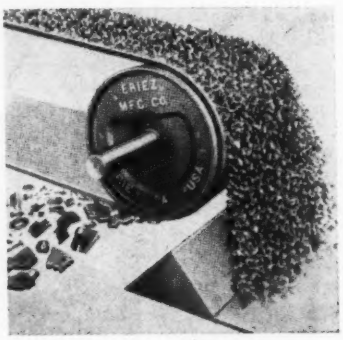
Linde to Expand Facilities at Peoria

Construction has started on an oxygen filling station and acetylene producing plant at Creve Coeur, a suburb of Peoria, Ill., The Linde Air Products Company, unit of Union Carbide and Carbon Corporation, announced recently. The plans also include a warehouse for the distribution of Union Carbide.

The new filling station and plant, located on Wesley Road, just outside the city limits of East Peoria, will provide industries in the area with a convenient supply of two of the company's main products, Linde oxygen, and Prest-O-Lite acetylene. The plant will be served by a spur track of the Nickel Plate Railroad.

Permanent Non-Electric Pulley—A New Development in the Mining Field

The first completely self-energized magnetic pulley requiring no electric current to generate a magnetic field is now being commercially produced by the Eriez Manufacturing Co., Erie, Pa.



This pulley is adaptable to all applications requiring automatic separation of magnetic from non-magnetic materials conveyed on a belt.

This new development is said to offer a more efficient and economical means of removing iron objects or tramp iron from ores because no electrical energy is needed, and consequently, magnetic separation can be made at any point where separation can take place most efficiently.

This means an Eriez Non-Electric Magnetic Pulley can be installed on a portable unit that can be taken to various points in a mining and milling operation and metal separation can be made nearest the source of supply.

Powered by giant Eriez Alnico Alloy magnets, these non-electric pulleys have been placed in a variety of industries throughout the United States—often in hazardous locations where possible sparking has precluded the using of electrical power separators.

Since moisture, heat or cold does not affect the operating efficiency, the pulley may be installed out-of-doors, deep in a mine or at any point where direct current is available or readily accessible.

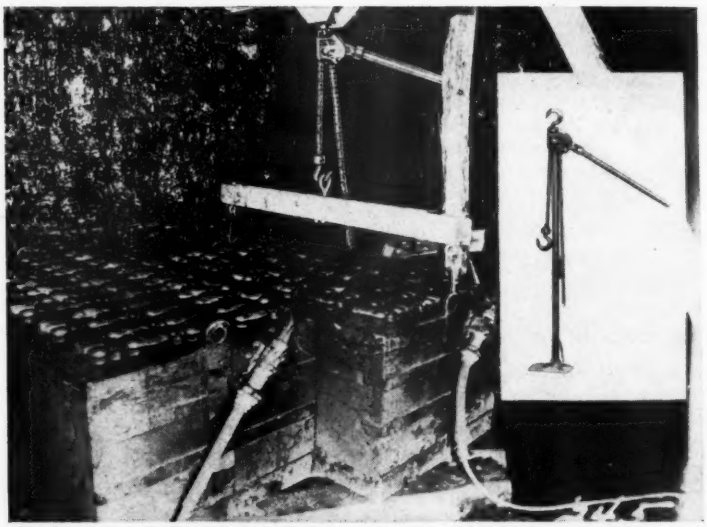
For complete information, write for Bulletin 501-A.

New Coffing Hoist Unit Doubles as a Jack

The Coffing Hoist Company, Danville, Ill., has recently introduced a new Hoist-Jack which is a combination hoist and jack designed to move or lift heavy loads in shops, mines and on construction jobs. Complete in only three pieces (stand, hoist and handle), the new Hoist-Jack has a rated capacity of 2,000 pounds, yet weighs only 23 pounds complete.

This equipment features a hoist whose ratchet-and-pawl construction uses the smallest possible number of working parts; a "safety-load" handle designed to bend at maximum overload before there is any possibility of the chain breaking or of the hooks straightening out; a stroke (which, at the top, brings the handle to a level just even with the top of the hoist frame horizontally) raises or lowers the load (thus requiring very little headroom), and is so compact that when taken apart it can easily be carried in a tool box. By mounting the hoist unit on the stand (which takes only a few seconds' time), a sturdy, powerful jack is obtained.

Designed for all-around shop and field use, the Hoist-Jack saves time and eliminates back-breaking effort on lifting or pulling work. Fully portable and easy to use, its many uses include setting machinery, changing tires on automobiles, trucks and tractors, lifting material, hoisting machinery onto skids for moving, retracking mine cars, as a load binder for various loads and stretching cable on wire. Although its rated capacity is one ton, it has been factory tested at two tons.



The handy new Coffing Hoist Jack is shown here at work deep in a mine, lifting and loading storage batteries from mine cars

San Francisco Firm Gets Large Turkish Contract

It has been announced that The Western-Knapp Engineering Co., Division of Western Machinery Company, with offices at 760 Folsom St., San Francisco 7, has been awarded a $1,500,000 contract for the building of two large ore dressing plants for the Republic of Turkey. Actual construction will commence early in 1948 and completion is expected by the end of the year. The materials and equipment used for these plants will be of United States manufacture.

Hand-Held Electric Tachometer Announced by G. E.

A new hand-held electric tachometer which weighs only 3 pounds has been announced by the Special Products Division of the General Electric Company. The intrument is designed to give accurate and direct readings of linear speeds from 10 to 10,000 f.p.m., and of rotational speeds from 100 to 10,000 r.p.m. Using accessories, rotational speeds from 10 to 100,000 r.p.m. may be measured.

Typical applications include measuring rotational speeds of motors, generators, turbines, and engines; measuring cutting speeds in f.p.m. on lathes and milling machines; and measuring linear speeds of planer beds, shapers, band saws, and conveyor belts.

The new tachometer consists of two units—the head, which is placed in contact with the moving object, and the indicating unit to which the head is attached by a flexible electric cable. Speed ranges can be changed while the spindle is rotating because there is no gear transmission to shift for various speed ranges. Accurate speed indications are assured by a low driving torque of only ¼ ounce-inch. The instrument cannot be damaged by overspeeding.

Vibration from the rotating machine does not affect the reading or make the instrument difficult to read. The instrument can measure both clockwise and counter-clockwise rotation. It is furnished in a carrying case.

Additional information is given in GEA 4895.

Death Takes Two Members of Ohio Brass

Harry S. Black, senior vice president and a member of the Board of Directors of the **Ohio Brass Company**, died suddenly at his home in Mansfield on October 9, after a brief illness.

Harry S. Black

Mr. Black was born in Mansfield October 17, 1867. He joined the Ohio Brass Company in 1898, ten years after it was founded. He was elected treasurer of the company in 1902 and held this position until 1919 when he was elected vice president. In 1928 Mr. Black was named senior vice president, the position he held at the time of his death.

C. H. Burkhalter

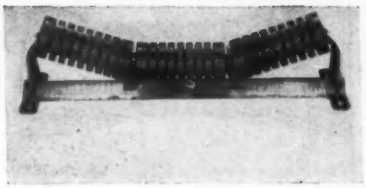
C. H. Burkhalter, 75, district manager of the Ohio Brass Company, Chicago, Ill., died October 18, after a brief illness. He had been with the company since 1919.

Goodyear Offers New Type Impact-Cushioning Idler

Belting engineers of Goodyear Tire & Rubber Company have developed a new type impact-cushioning idler for belt conveyors, supplementing the company's previous application of pneumatic tires beneath belts to absorb the shock of falling material.

Non-pneumatic, the new cushion type idler consists of rubber rings mounted on the idler core instead of the conventional rubber-covered steel idler. By comparison, maximum deflection is about six times greater, according to W. P. Hallstein, assistant manager of Goodyear's belting department.

High resiliency of the rubber rings solves the impact problem by decelerating the lump, Hallstein said. As a result, the life of even top quality belts is increased materially, doubled in some instances, he said.



The new device is an adaptation of the principles which led to using a battery of pneumatic tires, mounted on shafts revolving in bearings, to protect the belt at dumping points in coal and ore mining, and rock products operations.

Goodyear has contracted to make the molded rubber rings for several belt conveyor equipment firms, and Hallstein believes the principle will soon be adopted as standard practice.

— *Announcements* —

The **Joy Manufacturing Co.**, of Pittsburgh, Pa., announces the appointment of **W. L. Wearly**, as vice president in charge of coal mining sales. The appointment became effective November 1. Mr. Wearly has been with the company since 1937.

* * *

Appointment of **A. J. Jorgensen** as chief mechanical engineer, and **F. R. Gruner** as mechanical research and development engineer of the **Allis-Chalmers** basic industries department, and **B. H. Puerner** as manager of the department's crushing, cement and mining machinery section, has been announced by G. V. Woody, manager of the basic industries department.

* * *

Appointment of the **Industrial Equipment Company** of Louisville, Ky., as a distributor of the entire Hewitt Rubber Division's line of industrial hose, belting and packing, was announced here by J. H. Hayden, vice president in charge of sales, **Hewitt-Robins Inc.**

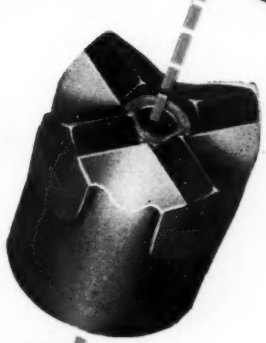
* * *

It was announced by Newell H. Orr, vice president of **The Colorado Fuel and Iron Corp.**, that **H. C. Allington** has been appointed general manager of sales of the **Wickwire Spencer Steel Div.**, with offices in New York City.

Index To Advertisers

They're Ready

REVOLUTIONARY CARSET JACKBITS



You have been hearing about the new Ingersoll-Rand CARSET bit with *CARBOLOY* cutting edges. Here it is—an alloy steel bit with cutting edges of tungsten carbide, the hardest metallic substance made by man. Although developed with heavy drifters and high air pressures, the Carset Jackbit is in keeping with, and ideally suited to, the modern trend toward smaller machines and smaller holes. The amazing performance of this new *ultra-hard tipped* bit is due in part to its use with the recently announced "Jackstud" bit connector. Reports from mines and tests in our development work indicate the Carset bit to be one of the greatest advances in rock drilling history. We are confident that the Carset Jackbit opens the door to a new era in rock drilling. Performance and specific advances read like a driller's dream.

CARSET JACKBIT after drilling 307 FEET

in Barre Granite with a DA-35 Drifter at 90 psi

FOR INSTANCE, YOU CAN—

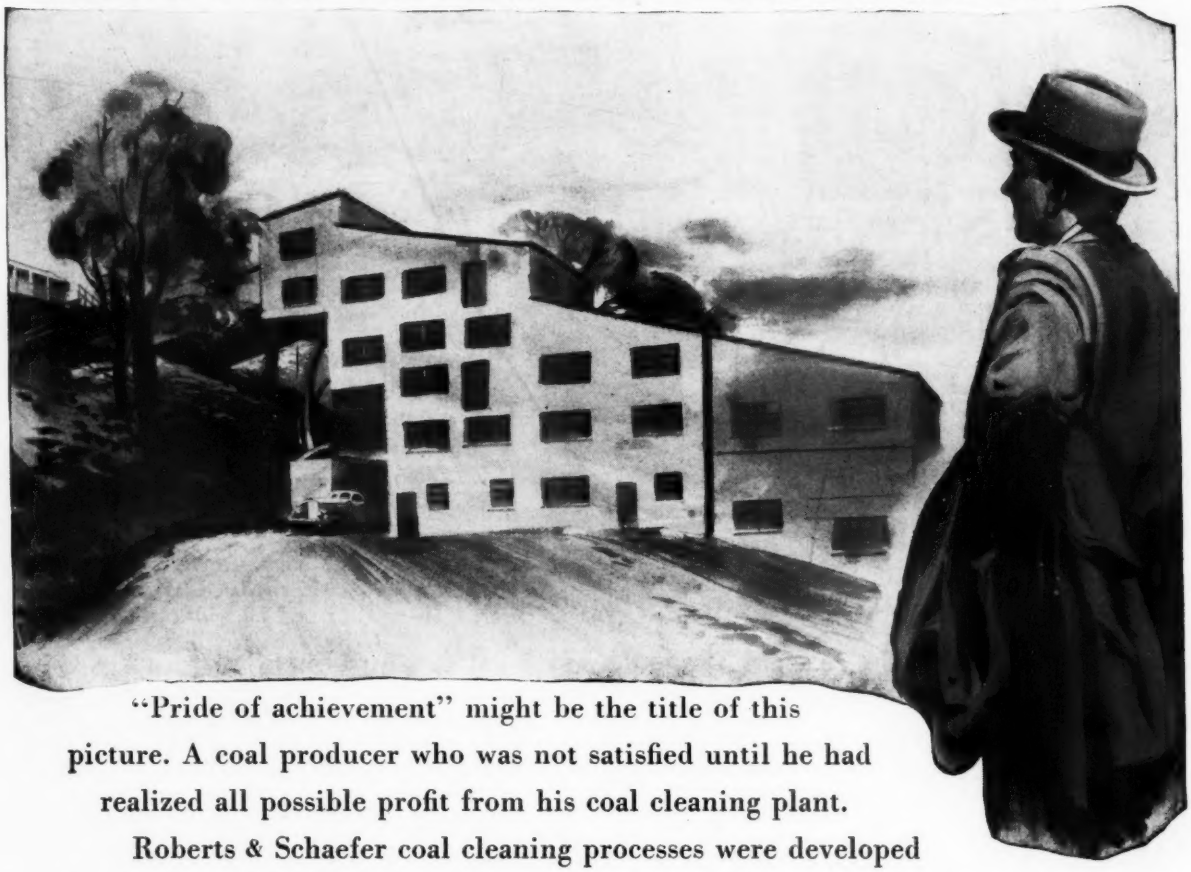
Drill continuously with one size bit
Use steels as long as the setup will permit
Increase drilling speeds 20% and higher
Almost eliminate the changing of bits
Drill small, uniform diameter holes
Materially reduce explosive costs
Drill the hardest rock
Reduce or even eliminate bit reconditioning
Use lighter drills
Drill more holes with the same amount of air
Finish more rounds per month

Order some Carset Jackbits and Stud Jackrods now and determine the economics of their use in your own operation.

Ingersoll-Rand

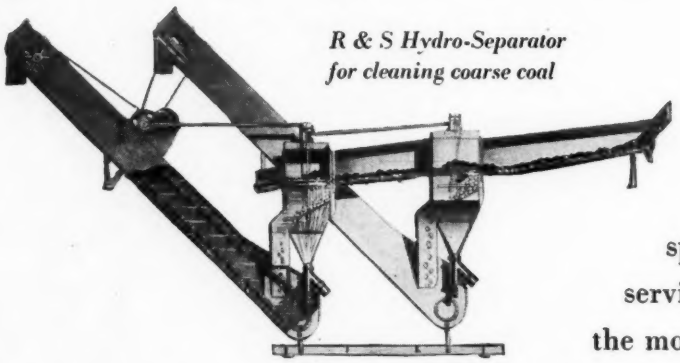
36-15 11 BROADWAY, NEW YORK 4, N. Y.

HERE IS A MAN WHO KNOWS HOW TO MAKE HIS COAL PAY —



"Pride of achievement" might be the title of this picture. A coal producer who was not satisfied until he had realized all possible profit from his coal cleaning plant.

Roberts & Schaefer coal cleaning processes were developed for this man. The Hydro-Separator for coarse coal 6″ x ¼″, Hydrotator for fine coal and the Stump Air Flow for dry cleaning. These units and Roberts & Schaefer specialized engineering service combine to produce the most profit from mine output.



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